

THESIS/REPORTS  
NORTHEASTERN...

NE History

L DIVISION OF  
FOREST MANAGEMENT AND FIRE RESEARCH  
NORTHEASTERN FOREST EXPERIMENT STATION  
U. S. FOREST SERVICE  
August 15, 1958

(31)  
Indiana





## DIVISION OF FOREST MANAGEMENT AND FIRE RESEARCH

This Division of the Northeastern Station has responsibility for planning and directing the technical aspects of the forest management and fire control research program conducted by the Station in 12 of the northeastern states (see map).

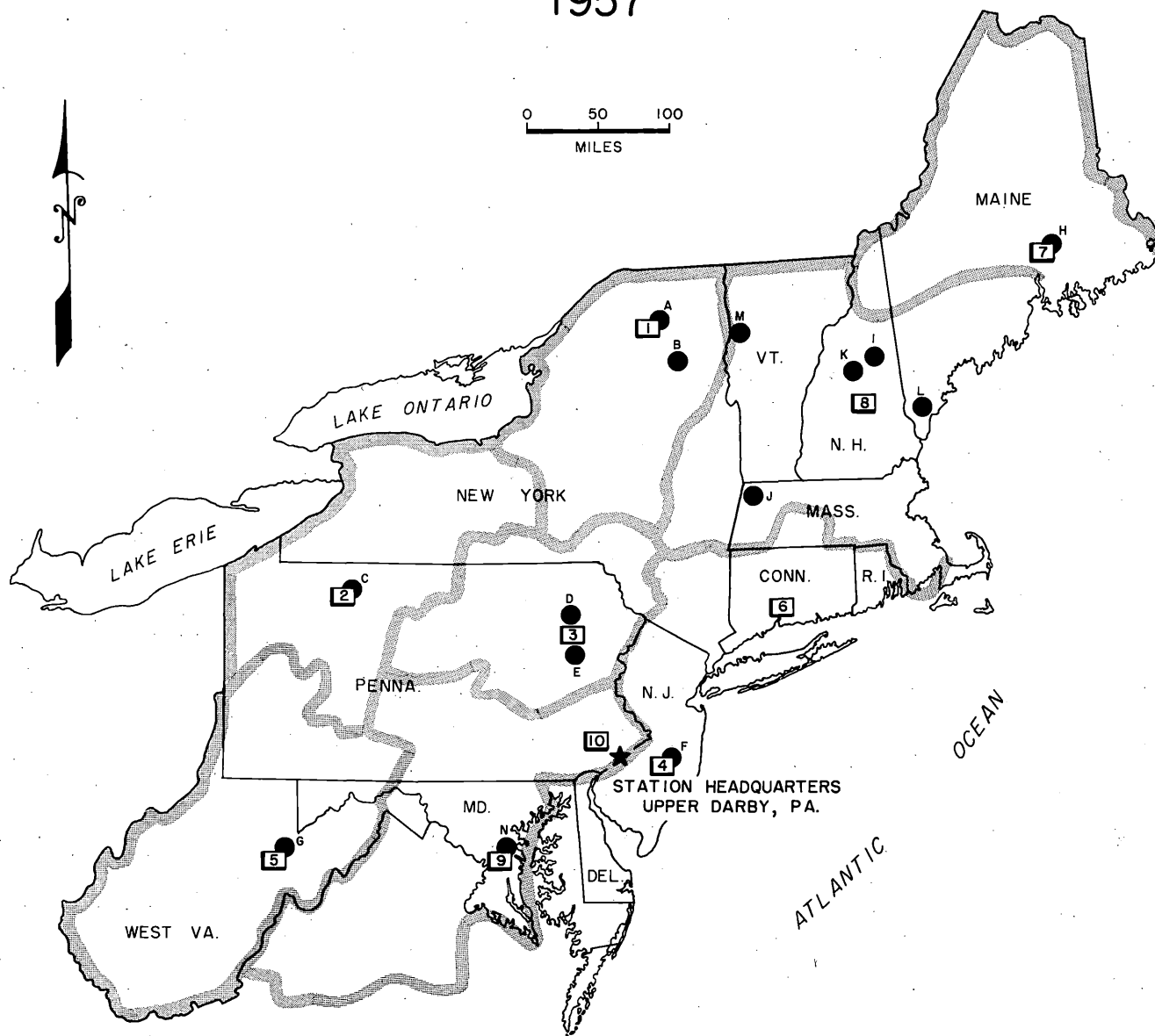
Practically all of the forest management research projects of the Station are conducted at the Morris Arboretum, the eight research centers, the 14 experimental forests and on lands of cooperators. The two Division assistants in forest management conduct a few studies from the Upper Darby office. The Division assistant in fire control conducts research from the Upper Darby office in cooperation with other public agencies in the Station's territory and occasionally with the Station's field offices.

Information follows about the Division staff, and about the field offices conducting forest management research.

### DIVISION STAFF

1. Richard D. Lane - Chief of the Division
2. W. E. McQuilkin - Division Assistant and conducts research in the use of silvicides and in regeneration.
3. Robert W. Wilson - Division Assistant and conducts some research in white pine soil-site-growth relationships. (currently completing work for Ph.D. degree)
4. Wayne G. Banks - Division Assistant and conducts research in fire control.
5. Mrs. Margaret P. Milano - Division Secretary
6. Mrs. Sevilla Diehl - Stenographer (part time)
7. Mrs. Sylvia Horowitz - Secretary (shared with Division of Watershed Management Research).

# REGION SERVED BY THE NORTHEASTERN FOREST EXPERIMENT STATION 1957



## RESEARCH CENTERS AND FIELD LABORATORIES

- |  |  |
|--|--|
| 1. ADIRONDACK CENTER (PAUL SMITHS, N. Y.)      | 6. FOREST DISEASE AND INSECT LABORATORY (NEW HAVEN, CONN.) |
| A. PAUL SMITH EXPERIMENTAL FOREST              | 7. PENOBSCOT CENTER (BANGOR, ME.)                          |
| B. FINCH PRUYN EXPERIMENTAL FOREST             | H. PENOBSCOT EXPERIMENTAL FOREST                           |
| 2. ALLEGHENY PLATEAU CENTER (KANE, PA.)        | 8. WHITE PINE-HARDWOOD CENTER (LACONIA, N. H.)             |
| C. KANE EXPERIMENTAL FOREST                    | I. BARTLETT EXPERIMENTAL FOREST                            |
| 3. KINGSTON CENTER (KINGSTON, PA.)             | J. HOPKINS EXPERIMENTAL FOREST                             |
| D. POCONO EXPERIMENTAL FOREST                  | K. HUBBARD BROOK EXPERIMENTAL FOREST                       |
| E. DILLDOWN EXPERIMENTAL FOREST                | L. MASSABESIC EXPERIMENTAL FOREST                          |
| 4. COASTAL OAK PINE CENTER (NEW LISBON, N. J.) | M. BURLINGTON, VERMONT, LABORATORY                         |
| F. LEBANON EXPERIMENTAL FOREST                 | 9. VIRGINIA PINE-HARDWOOD CENTER (LAUREL, MD.)             |
| 5. MOUNTAIN STATE CENTER (ELKINS, W. VA.)      | N. BELTSVILLE EXPERIMENTAL FOREST                          |
| G. FERNOW EXPERIMENTAL FOREST                  | 10. MORRIS ARBORETUM (CHESTNUT HILL, PA.)                  |



## DIVISION RESEARCH PROJECTS

1. Fire research (Banks): Practically full time of one man on this project. Major activities have been:
  - A. Forest fire problem analyses by states or regions.
  - B. Study of rates of wildfire spread, based upon reports by cooperators on individual fires.

Other activities: collaborated with Virginia Pine-Hardwood Center in a test of Primacord for blasting fireline (completed 1957); now preparing plan for study of methods for prescribed burning in Virginia pine.

2. White pine growth as affected by environmental factors (Wilson); this study and active participation in other white pine research may take about half of Wilson's time.
3. Planting studies in scrub oak (McQuilkin); major emphasis has been on methods of site preparation, secondary emphasis on species adaptability. These studies are a carry-over from McQuilkin's assignment at the Kingston Center, and are nearing completion. Presently are taking 10 to 20 percent of his time.

Morris  
Arboretum



## THE MORRIS ARBORETUM

The forest genetics research project was started in the fall of 1936, when the Northeastern Station was located in New Haven, Connecticut. From 1937 to 1941 tree breeding studies were done on the grounds of Yale University and in plantations of the New Haven Water Company. In 1942, when the Station moved from New Haven to Philadelphia, several possible locations for the tree breeding work were investigated. The Philadelphia area was chosen because of the excellent facilities and cooperation extended by the Morris Arboretum of the University of Pennsylvania, and because of its rich heritage of mature exotic tree species. During the Colonial Period Philadelphia was the center of botanical interest in North America; it was the home of such early American botanists as James Logan, John Bartram, Humphry Marshall, and European botanists made Philadelphia their headquarters for their botanical explorations in the New World. An illustrious and continuous line of botanists, naturalists, nurserymen, estate owners, and gardeners have maintained this local interest in gardens and trees. Nowhere else in the United States is such a variety of exotic forest trees, both hardwoods and conifers, available to the tree breeder.

Thus, the principal headquarters for the Station's genetic research staff and program now is the Morris Arboretum, in northwest Philadelphia. The Arboretum is owned and operated by the University of Pennsylvania. Offices, a small laboratory, greenhouse facilities, a small nursery, and a wide variety of tree

species used in the research program are provided at a nominal cost by the University. Additional genetics research is conducted at the Burlington, Vermont, Project of the White Pine-Hardwood Research Center and provenance tests for several species are underway at some of the experimental forests.

Most of the breeding work is done in the greater Philadelphia area, and particularly on the grounds of the Morris Arboretum. The experimental genetics stock is grown in the State nurseries of New Jersey, New York, and Maryland, through the cooperation of the respective State Forest Services. Test plantations of pedigreed progenies are made on various experimental forests operated by the Station, particularly on the Hopkins and Beltsville Forests. Pedigreed stock is also distributed to a number of cooperators in this and other regions for field tests.



## ARBORETUM PROGRAM

### Major research projects:

1. Hybrid poplars: Clonal tests at various experimental forests; nation-wide clonal tests with volunteer private cooperators; a new study to determine the correlation between anatomical characteristics of roots and stems and their growth rate; a new study of intersectional hybridization, using aspen hermaphrodites (20 percent of time).
2. Crossability studies in various commercially important tree genera--old study; plans to be revised and work expanded; in successful crosses, hybrids will be evaluated for hybrid vigor, pest resistance, timber form (30 percent of time).
3. Cooperative range-wide provenance tests with white pine--Southeastern, Central States, Lake States, Northeastern Stations, and Southern Research Station of Canada; total of 32 provenances to be tested; study now in the nursery phase. Northeastern Station to carry the major responsibility (15 percent of time).
4. Michaux Quercetum--to develop a breeding arboretum of authentic oak species and conduct exploratory studies of racial variation (10 percent of time).

### Other work--small or informal studies (25 percent of time).

1. Field trials of various pedigreed stock--pine, spruce and others.
2. Chromosome studies in Picea and Pinus.
3. Study of occurrence of bisexual strobili in Picea
4. Hybridization experiments using a white pine in Maryland of exceptional vigor as the male parent.

## PERSONNEL

### Permanent

1. Name: Ernst Jefferson Schreiner (Ernie)

Title: In-charge, Forest Genetics Research

Current Assignment: FM - Forest Genetics Research

Major Professional Interest: FM - Forest Genetics Research

Formal Education and Training: BS - New York State College of Forestry; Ph. D - Columbia University; 3-months Forest Service Statistical Seminar (Washington)

Experience: 1924-1935 - Research Forester, Oxford Paper Company, Rumford, Maine; breeding hybrid poplars; growth and yield studies with northeastern hardwoods and conifers; insect and disease surveys; timber cruising; research on the relationship of fiber characteristics to pulp and paper production and qualities; microscopic analysis of pulp, paper, and paper surfaces.

1935-1936 - Associate Tree Crop Specialist, Forest Division, Tennessee Valley Authority; started a tree selection and breeding program.

1936-present - In-charge, Forest Genetics Research, Northeastern Forest Experiment Station.

2. Name: Frank Shalvey Santamour, Jr.

Title: Geneticist

Current Assignment: FM - Forest Genetics

Major Professional Interest: FM - Forest Genetics Research

Formal Education and Training: University of Massachusetts - B.S. cum laude (Forestry); Yale University - M.F. - Harvard University - A.M. (Biology); University of Minnesota - has completed residence and is now working on thesis for Ph. D. - major (Forestry) - minor (Plant Genetics)

Experience: 1953 - 3 months, FM research, Penobscot Experimental Forest.

1954-1956 - Research Assistant, Maria Moors Cabot Foundation, Harvard University, 1957.

1957-present - Forest Genetics Research.



3. Name: Harry Charles Kettlewood

Title: Forestry Aid (Research)

Current Assignment: FM - Forest Genetics

Major Professional Interest: FM - Forest Genetics

Formal Education and Training: 2 years - Pennsylvania State University; 2 years - U. S. Army Occupation of Germany

Experience: 1951 - Boise National Forest - Smokechaser;  
1954-1955 - Damon and Foster, Civil Engineers, Sharon Hill, Pa., Transitman  
1956 - Northeastern Forest Experiment Station; in present position since April 16, 1958.

4. Name: Harriett D. Shapiiro

Title: Clerk-typist

Current Assignment: FM - Forest Genetics

Major Professional Interest: Clerical

Formal Education and Training: West Philadelphia High School

Experience: 1943-44 - Federal Reserve Bank, Philadelphia  
1944-1947 - Army Ordnance, Philadelphia  
1947-1949 - United Specialties Corporation, Philadelphia  
1950-1952 - Naval Aviation Supply Depot, Philadelphia  
1956 - present - Forest Service, Morris Arboretum, Philadelphia -  
in present position since October 8, 1956.

Adirondack



## THE ADIRONDACK RESEARCH CENTER

Headquarters for the Adirondack Research Center are maintained at Paul Smiths, New York in cooperation with Paul Smiths College. The Station's timber management research program in forest types and problems of the Adirondack Mountains and immediately adjacent areas is conducted from this field office. Information follows about these forests, the major research facilities available to the Center, and the Station personnel assigned there.

Forests, predominantly spruce-fir and northern hardwoods, cover 60 percent of the Adirondack Mountains and adjacent fringe areas. However, about 13 percent of the forests either are not available or are unsuitable for commercial forest production. Topography varies from plateau and foothills to steep mountains, ranging up to 5,300 feet in elevation. Soils are varied but generally thin, stony and acid--not well suited to agriculture.

Forest types are strongly related to topography and, since the area has been glaciated, they often change abruptly. The best stands of conifers occur at the lower elevations, with some good spruce on high slopes. The most fertile soils support the best stands of northern hardwoods. Seedlings, saplings, and poles occupy about one-third of the forest area and sawtimber occupies the remaining two-thirds.

The ownership pattern for forest land is dominated by industrial holdings. Among the industrial ownerships, those of pulp and paper companies are most extensive. Most of the non-commercial forests are publicly owned, occurring as parks and preserves unavailable for commercial operations. Farm forests are less extensive here than those in other parts of the Northeast. The present ownership pattern is expected to remain quite stable for at least the immediate future.

Recreational values of forest lands here are among the highest in the Northeast. Being within striking distance of the nation's heaviest population concentrations, all types of forest recreation are intensively developed and enjoyed. Interests in recreation as well as in wildlife and watershed management are almost certain to exert increasing pressures for multiple-use forest management in the Adirondack Mountains and adjacent areas.

#### MAJOR RESEARCH FACILITIES

Office space for the Adirondack Research Center is furnished by Paul Smith's College on the campus. The research program conducted by the Center is concentrated at the following experimental forests:

1. Paul Smiths Experimental Forest. During 1948 the Station entered into a 30-year cooperative lease with the Paul Smith's College for this Forest. It is a 2,300-acre tract of hardwoods and softwoods located near Paul Smiths, New York. The forest is

being used for studies of applied silviculture and management, studies of methods for stand improvement with chemicals, and studies of silvicultural practices.

2. Finch Pruyn Experimental Forest. This 640-acre forest, located near Newcomb, New York, is owned by Cornell University. The University and the Station entered into an agreement in 1934, making the tract available for cooperative research. Studies underway there now are directed at problems of getting reproduction, and of cutting methods.

3. Northern New York Experimental Forest. During 1958 the Station entered into agreement with the St. Regis Paper Company authorizing a cooperative research program on approximately 1000 acres of the Company's 10,000 acre tract. A program of timber management research and demonstrations is being developed.

## CENTER PROGRAM

Major forest types in which work is being done:  
northern hardwood, spruce-fir.

### Major projects or fields of research

1. Compartment management study (50 percent of time); 26 softwood, 8 hardwood compartments; both second growth and old growth stands. Main variables: all-aged vs. even-aged management, 4 intensities of management, short vs. long rotations for even-aged management.
2. Silvicides for TSI (25 percent of time); this has involved some comparisons of chemicals and methods of application; main emphasis has been on techniques for using sodium arsenite, which has led to recommendation of application in spaced ax cuts. This technique is being adopted on both state and private lands. Sodium arsenite in complete frills found to be a fairly effective debarking treatment.

### Other activities (25 percent of time)

1. Farm woodland demonstration (softwood type).
2. GPL plots (softwood type).
3. Methods of cutting study (hardwood type) on Finch Pruyn Experimental Forest, including deer exclosures.
4. Cooperation with New York State College of Forestry in silvicultural studies (hardwoods).
5. Cooperation with St. Regis Paper Company in silvicultural studies (hardwoods).



## PERSONNEL

### Permanent

1. Name: Francis M. Rushmore (Frank)

Title: Research Center Leader

Current Assignment: Forest Management Research, Adirondack Research Center

Major Professional Interest: Research in Forest Management, Silviculture and associated fields

Formal Education and Training: Forestry: Pennsylvania State University, BS in Forestry, also several graduate courses in Forest Research, 1935-1939. U.S.F.S. Personnel training Conference, Feb. 12-14, 1948. NEFES Log Grading Schools, 1948 and 1957. FS Statistical Seminar, Washington, D.C., 1948. Military: R.O.T.C. in college, 2 years, Master Sergeant. Entered U. S. Army March 1941, private; Officer's Candidate School - Artillery - commissioned 2nd Lt. in 1942; released from active duty Dec. 1945, Captain; 1958, U. S. Army Reserve, Lieut. Colonel. Served with 28th Infantry Division, 43rd Infantry Division, Hq. U.S. Army, in New Zealand, and Artillery Training Center at Fort Sill. Some military duties: artillery, personnel, adjutant general, administration, intelligence, counter-intelligence, provost marshal, air supply, transportation, and defense counsel - General Court. Overseas 28 months, 1942-1945. Completed Associate Course of the U.S. Army Command and General Staff College, 1950-1952.

Experience record: 1933-34 - 13 mos., C.C.C., Monument, Pa., truck trails, surveying, stationary engineer, forest fires 5 consecutive days in May 1934; 1936-1938 - 9 mos., tree surgery, contractor, self-employed; 1939-1940 - 12 mos., ground control survey for aerial photo scales, U.S. Dept. Agric., 21 counties in Pa.; 1940-1941, 4 mos., cook, 8-12 man carpenter crew, Pa. R. R.; 1946, March - began employment with NEFES; 1946, 6 mos. - sawmill production and census, Pa., N.J., Md., and N.Y., special census agent 1946-1948; 1946-1947, 12 mos. - Cooperstown, N.Y. Branch (NEFES), Economics, forest cooperative, sawmill production, stumpage returns, forest taxation (Maine and Washington Office 1 mo.) 1947-1950, 34 mos. - Beltsville Experimental Forest (NEFES). Forest management research: work plans compartment experiment, site preparation and tree planting study, genetics, Virginia pine thinning study. Forest Fire fighting duty in Maine 23-30 Oct., 1947. In charge of forest - acting - Sept. 1949 - June 1950; Aug. 1950-present - Adirondack Research Center

(NEFES). Forest management research, compartment experiment, local volume tables, silvicide and debarking studies, formal agreements for cooperative research (industry, university). Research Center Leader, March 1954-present.

2. Name: Elwood Lewis Shafer, Jr. (Dick)

Title: Research Forester

Current Assignment: Forest management research, Adirondack Research Center, compartment experiment, reproduction inventories, timber marking, tree grading, stand improvement, photographer, and safety officer

Major Professional Interest: Statistics and genetics

Formal Education and Training: Forestry, Pennsylvania State University, B.S., Feb. 1956, M.F., major genetics and minor in statistics, Pennsylvania State University, Jan. 1957. NEFES Hardwood Log Grading School - Manchester Center, Vt., Oct. 28-31, 1957. NEFES Hardwood Log Grading School - Moria, N.Y., Dec. 16-18, 1957. U. S. Navy, Naval Aviation Cadet, Aug. 11, 1951 - June 13, 1953; included courses in navigation, engines, aerology, radiological defense, mathematics, and U.S. naval history.

Experience: 1955, 3 mos. - surveying, Penna. Dept. Forests and Waters, Hickory Run State Park. 1956, 6 mos. - Engineering Research, Pennsylvania State University, part-time assistant. 1956-1957, 12 mos. - graduate assistant, Pennsylvania State University, School of Forestry. 1957, Feb. - began employment with NEFES.

3. Name: Gerald C. LaVoy (Gerry)

Title: Forestry Aid

Current Assignment: Forest management research, Adirondack Research Center, reproduction inventories, photos, crewchief, tree grading, timber marking, stand improvement; administration, Property Custodian, Imprest Fund Cashier

Major Professional Interest: Forest management

Formal Education and Training: Graduate Tupper Lake High School, 1945. ICS correspondence course in mathematics. NEFES Log Grading School, Manchester Center, Vt., Oct. 28-31, 1957. Forest fire training school, Rutland, Vt., March 25-26, 1958

Military service: Army Air Corps, March 1945-Dec. 1946, corporal. Active duty in Italy with the 9th Air Force. Forestry Engineer Co., U. S. Army Reserve, 1954-1957, Sergeant First Class

Experience: March 1947 - began work for Veterans Administration Hospital, Sunmount, N. Y.; Sept. 1950 - transferred to Adirondack Research Center, NEFES, clerk-typist. In Dec. 1954 promoted to forestry aid.

Summer Assistants

1. Rouse Fountain, GS-4, Paul Smith's College
2. Jerome Sambaugh, GS-4, Paul Smith's College
3. William R. Carr, GS-3

Allegh.  
Plateau



## THE ALLEGHENY PLATEAU RESEARCH CENTER

This Center conducts research in timber management problems common to the Allegheny Plateau forests in the Northeast. It operates from Station Headquarters in the winter months and from the Kane Experimental Forest during the summer field season. The forests of the Allegheny Plateau and its fringe areas are described below. Information about the experimental forests on which the Center's work is concentrated and Station personnel assigned to the Center follows this description.

Geologically, the Allegheny Plateau may be divided roughly into two parts: (1) the northern Allegheny Plateau section of Northwestern Pennsylvania and Southwestern New York which is the most heavily forested; and (2) the central lowlands of New York and the Lake plains area, which is more lightly forested. The former section is a dissected plateau; the latter rolling hills and valleys at lower elevations. Approximately 46 percent of this area is in commercial forest.

Of the commercial forest, 75 percent is privately owned and 25 percent is in public ownership. Industrial ownership represents 51 percent of the total, farm woodland 24 percent; State 18 percent, National Forest 6 percent, and other public 1 percent.

The distribution of forest types within the commercial forest land is as follows: Allegheny hardwoods-hemlock 47 percent, mixed

oaks 36 percent, aspen-pin cherry 13 percent, white pine hardwoods 2 percent, and other types 2 percent.

The growing stock is mostly hardwoods with the bulk of the cubic foot volume in trees 14" and less in d.b.h. Volumes per acre average 870 cubic feet and 1,807 board feet of all species. The species of the Allegheny hardwoods-hemlock type make up over one-half of the cubic foot volume and about two-thirds of the board foot volume.

Timber quality varies from poor on the open-grown stands of sprout origin that followed heavy cordwood cuttings, to good on some of the older second growth of seedling origin that has been properly managed by thinnings and partial harvest cuttings. Fire devastated lands are still a problem in the aspen-pin cherry type. Heavy cutting and high grading for veneer, for turning stock of maple and ash, and for the limited supply of coniferous structural timber is still in progress.

#### MAJOR RESEARCH FACILITIES

The two principal research facilities available to this Center are:

1. Kane Experimental Forest. RD #2, Kane, Pa. This area is located on the Allegheny National Forest in northwestern Elk County, about 7 miles southeast of Kane, Pennsylvania. Two dwellings, an office, a garage and a shop comprise the headquarters ~~(Fig. —)~~. These buildings are at the junction

of forest development roads 123 and 138 (Seven Mile Road and Dahoga Road).

The Kane, which contains 1,737 acres, was dedicated to forest research use by the Forest Service on March 23, 1932. The tract contains 70 acres of old-growth beech-maple forest, about 960 acres of older second growth black cherry-maple-beech, and 707 acres of young growth in various stages of restocking.

Elevations range from 1,640 to 2,090 feet above sea level, with the valley slopes steep and plateau tops relatively flat. Soils are residual or colluvial in the absence of glaciation.

Several silvicultural<sup>and</sup> timber management studies were initiated on the Kane soon after it was established. These have been maintained and are continuing to yield extremely valuable results.

2. Tionesta Natural and Scenic Area. This tract is located about 7 miles south of Ludlow, Pennsylvania, in the Allegheny National Forest. It has been divided into the Scenic Area (2,018 acres) and the Natural Area (2,113 acres).

The area was dedicated by the Forest Service on July 31, 1940, to serve as a living museum for scientific study and for the education and enjoyment of the public. No buildings or roads, except for oil and gas company developments and a Forest Service access road, have been constructed within the area. It is being

preserved from logging and fire and the native animal and plant life are being kept in as natural condition as possible. Study of soil, water, climate, forest and other plants, and animal life, is encouraged under the auspices of the Northeastern Station.



## CENTER PROGRAM

Major forest types in which work is being done:  
Allegheny hardwoods and hardwoods-hemlock.

Major field of research: conventional silvicultural plot studies, some going into the third decade, with periodic remeasurements and/or retreatments. Collectively, these studies take about 80 percent of the time. Main study categories:

1. Weeding and thinning--second and third growth sapling stands, three degrees of treatment, with black cherry, sugar maple, and red maple the focal species.
2. Growth and yield under various regimes of cutting in both old growth and second growth stands.
3. Development of reproduction under various cutting regimes and understory treatments.
4. Recovery of stands after glaze-storm damage.
5. A hardwood pruning study--flush and stub cuts on black cherry, sugar maple, beech, yellow and sweet birches, with periodic dissections of sample trees.
6. Studies of deer and rabbit damage--fenced exclosures, extensive stocked-quadrat surveys.

Other activities (20 percent of time)

1. CPL plots
2. Red pine seed source study (cooperative with L. S. Station).
3. Study of minimal effective dosages of silvicides.
4. Ecological studies on the Tionesta Area.

## PERSONNEL

### Permanent

1. Name: Ashbel F. Hough (Ash)

Title: Research Center Leader (Forester, Silviculture)

Current Assignment: In charge of forest research by  
Forest Service at Allegheny Plateau Research Center

Major Professional Interest: Forest Management (Silvicultural  
Research) in the Allegheny hardwoods-hemlock forest region,  
particularly silvics and ecology. Range Management Research

Formal Education and training: New York State University,  
College of Forestry, Syracuse, N.Y. BSF degree 1923 -  
Silviculture Management. Yale University, School of  
Forestry, New Haven Conn. MF degree 1927 - Silviculture.

Experience: U. S. Army 1918. S.A.T.C. George Washington  
Univ., Wash., D.C., Courses in Chemical Engineering.  
(Honorable discharge) Dec. 9, 1918. University of Penna.  
1929-38. Non-credit courses in Botany Department (ecology  
and soils, history of agriculture, botanical history by  
Drs. True, Wherry, Hershberger and Seifitz); Wharton Business  
School by Dr. Schluter in Research Methods and Dr. Rice in  
Business Statistics. In-Service training in R2, R-3, R-5,  
R-7, U. S. Forest Service 1922-to date. On graduation  
from McKinley Manual Training High School, Wash., D. C.,  
in 1918, had temporary employment in Washington Gas Light  
Co., Veterans Bureau 1919, Quartermasters Corps 1919,  
Census Bureau 1920, and again in Veterans Bureau 1920.  
Employed by Forest Service during summer of 1922 in Region 2  
on Montezuma (now San Juan N.F.) National Forest on grazing  
reconnaissance. In 1923-24 employed 10 months as Ranger on  
Jornada Range Reserve, Las Cruces, New Mexico, on grazing  
studies work by Forest Service, Region 3. Transferred to  
grazing reconnaissance in Region 5, May 1924 to June 1926,  
working on California (now Mendocino) N.F. and Stanislaus  
N.F. with detail to Regional Office in San Francisco, Cal.  
From June 1926 to Sept. 1926, employed by Forest Service  
Region 7 at Appalachian Forest Experiment Station, Asheville,  
N.C. Worked with E. F. McCarthy on forest management studies  
in North Carolina, Virginia and West Virginia. Made tour of  
England, France, Germany, Austria, Italy, and Switzerland,  
with students of Oxford Imperial Forestry Institute, June-  
Sept. 1927, on graduation from Yale School of Forestry.  
Began work with newly created Allegheny Forest Experiment  
Station Sept. 1927 as Junior Forester, Assistant Silviculturist,

Associate Silviculturist, Silviculturist and Forester, with headquarters in Philadelphia. Station later merged with Northeastern Forest Experiment Station and headquarters moved to Upper Darby, Pa., 1941. Since 1927 have been in charge of forest management research in the Allegheny Plateau forest region. This was given the status of a Research Center about 1943 by Director L. V. Harper. Developed the Kane Experimental Forest 1932 to date, with aid of Ranger P. E. Ackerman (deceased) and numerous field assistants.

2. Name: Harold J. Huntzinger

Title: Research Forester

Current Assignment: Research projects in silviculture, forest influences and forest management

Major Professional Interest: Forest management, natural and artificial regeneration, timber stand improvement, stocking and stand structure

Formal Education and Training: Purdue University - BS degree in Forestry; Job Methods Training course in 1947 on Jefferson National Forest; Red Cross First Aid course in 1947; photo interpretation training course by Earl Rodgers 1948

Experience: 1931 - 3 mos. Clearwater National Forest, Blister Rust control; 1933 - 10 mos. - Pisgah National forest, timber stand improvement, and collecting tree seeds; 1934 - 4 yrs., 2 mos., Allegheny National Forest, timber stand improvement, tree planting, volume table study, forest survey, collecting tree seeds, and forest pest control; 1938 - 10 years - Jefferson National Forest, timber management, timber marking, scaling, sale area betterment, general district assistant, ranger district dispatcher, and fire prevention; 1948 - NEFES - 8 years forest survey in states of New York, New Hampshire, Vermont, Maine, Pennsylvania, and New Jersey; 1956 - Allegheny Plateau Research Center, Kane, Pa., - silviculture, remeasurement of weeding and thinning plots; remeasurement of 20 year old Red Pine plantation consisting of 50 seed sources and the statistical analysis of the data obtained; chemical control of hardwoods; pruning red pine; black cherry regeneration; and timber management.

#### Summer Assistants

1. Wayne Smetanka, GS-3, Paul Smith's College
2. Robert Stroh, GS-4, Penn State

Coastal  
Oak-Pine



## THE COASTAL OAK-PINE RESEARCH CENTER

This field office, with headquarters on the Lebanon Experimental Forest near New Lisbon, New Jersey, conducts the Station's timber management research program in the coastal oak and pine forests of the Northeast. The coastal forests and their timber management problems are described below. These descriptions are followed by information about the principal research facilities used by the Center and Station personnel assigned there.

Hardwood types, in which several oak species usually predominate, form 62 percent of the coastal forests. Hard pines--pitch, shortleaf, loblolly, Virginia and pond--make up 65 percent of the softwood stands. About 94 percent of the land is privately owned. Small-size trees predominate in most stands, particularly north of Delaware. On the Eastern Shore of Maryland, stands containing more than 1,500 board feet per acre form 51 percent of the commercial forest area; in New Jersey, 25 percent; Connecticut, 17 percent; Rhode Island, only 3 percent. Timber quality is very low.

The poor condition of present forests, particularly north of Delaware, reflect a long history of intensive use and misuse. Beginning in the 1600's, the forests were cut heavily for lumber, naval stores, and other products. And for about 200 years they provided the fuel for all industries and homes.

Practically all the virgin timber was cut before the Revolution. As the use of coal, gas, and oil for fuel has increased over the past century, forest drain has decreased and trees can now grow to larger sizes than formerly. But the demand for small-size products is still abnormally high. Contributing factors are a heavy population, past land clearing and abandonment, and repeated wildfires. Cape Cod, Rhode Island, Long Island, and southern New Jersey have had many large wildfires. These sections include most of the wildfire problem areas of the Northeast. The forests of some other sections, for example, Connecticut and New Jersey, are on formerly cleared land; Connecticut forests covered 29 percent of the land area in 1860, 62 percent today. Here, weed hardwoods too often dominate the forest stand.

The sites and the species that should be favored for timber crops vary widely. Valuable species include: (1) loblolly pine on many sites in southern Delaware and Maryland; (2) high-quality hardwoods (oaks, yellow-poplar, sweetgum), particularly in northern Delaware, in the Delaware Valley and the northern part of New Jersey, and on some sites northward into Connecticut; (3) pitch pine on many sites in southern New Jersey and to a lesser extent northward; (4) shortleaf pine on many sites in southern New Jersey and to a lesser extent southward; (5) Atlantic white-cedar in the peat swamps, particularly of southeastern New England and southern New Jersey; and (6) white pine and hemlock

in southern New England and to a lesser extent southward into northern New Jersey.

Major research problems in this area include: (1) establishing productive forest stands to replace the sprouts, culls, or weed species that occupy many sites; (2) reproducing valuable species--pines, yellow-poplar, Atlantic white-cedar; (3) integrating timber production with other demands on the forests--for water, picnicking, hunting, summer or year-round homes; and (4) improved fire protection in the hot spots (South Jersey, Cape Cod, etc.).

#### MAJOR RESEARCH FACILITIES

During 1934 the Forest Service and the New Jersey Department of Conservation and Economic Development entered into an agreement that authorized the Station's use of 500 acres of the Lebanon State Forest for research. Offices for this Center, as well as a dwelling, workshop and garage, are located on this Forest.

Since the Lebanon does not provide a complete sample of the complex conditions in the coastal forests, many of the field studies are located elsewhere. Most of the currently active studies are underway in southern New Jersey and on the Eastern Shore of Maryland. So far as available areas permit these studies are located on state forest lands. In New Jersey these include the Lebanon, Bass River, Green Bank and Belleplain State Forests;

in Maryland the Pocomoke and Eastern Shore State Forests. The Maryland Department of Forests and Parks and the New Jersey Department of Conservation provide the land, timber, protection and access roads needed for these studies. They also assist in establishing many of the studies, making the prescribed treatments and taking the required measurements.

## CENTER PROGRAM

Major forest types in which work is being done: pitch pine, loblolly pine, and associated pine-hardwood types.

### Major research projects:

Silvicultural plot studies dealing with cutting methods and cultural treatments designed to suppress hardwoods and regenerate pines--pitch and shortleaf pines in southern New Jersey, loblolly and pond pines in the Maryland Eastern Shore Area. Various studies involve prescribed burning as a silvicultural treatment, testing effects of fire at different seasons and at different frequencies, sometimes supplemented with mechanical treatments (50 percent of time).

### Other activities (50 percent of time)

1. Regeneration studies: direct seeding experiments with pitch pine; a spacing study in loblolly pine plantations; a study of row thinning in a loblolly pine plantation.
2. Genetics: cooperating in southwide pine seed source study--plantings of both loblolly and shortleaf pines; outplantings of hybrid pines produced in California.
3. Forest-wildlife relationships: deer enclosure studies in pine and white-cedar types; study of rabbit repellents on planted loblolly pine seedlings.
4. Silvicides: comparison of treatments to control Japanese honeysuckle.
5. Silvical studies: storage of loblolly seed in forest floor; basal sprouting of loblolly pine; development of basal crook in pitch and shortleaf pine seedlings.
6. Atlantic white-cedar study (new in 1958)--study of factors controlling natural regeneration.

## PERSONNEL

### Permanent

1. Name: Silas Little, Jr.

Title: Research Center Leader, Coastal Oak-Pine

Current Assignment: Center Leader - 96% FM, 4% WM

Major Professional Interest: FM- silviculture, silvics, ecology, etc.

Formal Education and Training: BS, Massachusetts State College, 1935; MF, Yale, 1936; Ph.D., Yale, 1947

Experience: June 1, 1936, CCC foreman, Black Hills, S. Dak.; late August 1936, Junior Forester, CCC funds, Allegheny Forest Experiment Station. July 1, 1938 - July 1, 1940 - mostly on fire studies (weather, rate of spread, fuel types, equipment, etc.); since then mostly on silvicultural studies. Since October 1936 most of work has been in New Jersey and eastern Maryland.

2. Name: Horace Arthur Somes

Title: Forestry Aid

Current Assignment: Forestry Aid - 95% FM, 5% WM

Major Professional Interest: Silviculture and forest management

Formal Education and Training: Montclair (N.J.) High School 1930; graduate of 2-yr. Ranger course, Penn State Univ. 1932. Recently completed correspondence courses in English Composition and Rhetoric, English Exposition, Principles of Economics, and Algebra from Penn State Univ.; also Course A Statistical Methods at NEFES.

Military service; In Field Artillery Battalion from Sept. 1943 to Sept. 1945: staff sergeant and forward observer in France and Germany with 63rd Infantry Division; awarded battlefield commission as 2nd Lt. in Germany; then served as air observer for the field artillery until VE-Day. Awarded Bronze Star Medal, Air Medal, European-African-Middle Eastern Campaign Medal with 2 bronze stars, American Campaign Medal, Army of Occupation Medal, WW II Victory Medal. Discharged 1st Lt. August 1946



Experience: With N.J. Dept. Conservation for 3 months in 1933; foreman of CCC crew from June 1933 to July 1942 in N.J.; started as Aid at Station in August 1942 at New Lisbon.

3. Name: Herbert Bernard Tepper

Title: Research Forester (Forest Management)

Current Assignment: 96% FM, 4% WM--chiefly regeneration and management of yellow-poplar, sweetgum, and several oaks

Major Professional Interest: Physiology, anatomy, ecology

Formal Education and Training: B.S., N.Y.S. College of Forestry, 1953; M.S., State University of New York, College of Forestry, 1958; Nov. 1953 - Nov. 1955, served with U. S. Army in Germany

Experience: 1952, 3 mos. - Harvard Black Rock Forest, root studies; April 2, 1956 - joined Forest Service as an Aid, (subsequently permanently instated) 1 mo. - anatomical study of scar formation at Plant Industry Station, Beltsville, Md., 5 mos. - studying effect of light on growth of loblolly and Virginia pines; Sept. 1956, return to school for advanced degree where instructed in Botany and Physiology and worked for National Science Foundation on root studies of Red Pine; June 4, 1958 - returned to Station, Coastal Oak-Pine Research Center, hardwood management

Summer Assistant

1. Warner Taylor, GS-5, Yale

Kingston

## THE KINGSTON RESEARCH CENTER

This Center, with field offices in Kingston, Pennsylvania, conducts research in timber and forest watershed management problems of scrub oak, oak and northern hardwood forest types. Information concerning these problems, principal research facilities available to the Kingston Center and the Station staff members assigned to the Center is given here.

The timber and watershed management problems being studied from the Station's field office at Kingston deal primarily with hardwood forest types of the Pocono and Catskill Mountains and the Allegheny Plateau of Northeastern Pennsylvania and Southeastern New York. Here, 61 percent of the commercial forest land is privately owned, being held primarily for recreation purposes, such as resort hotels and rod and gun clubs, rather than for timber production. Nearly all of the publicly owned land is either state forest or state game land.

Ninety percent of the forests are hardwoods. Areas of major forest types are as follows:

<u>Forest Type</u>	<u>M Acres</u>	<u>Percent of Total Forest Area</u>
White pine	266	4
Hemlock	170	3
Hard pine	102	2
Other softwoods	93	1
Northern hardwood	2,492	40
Oak	2,815	45
Other hardwoods	323	5
All types	<u>6,261</u>	<u>100</u>

About 25 percent of the commercial forest land supports sawtimber stands, 50 percent pole timber stands, and 25% lesser stand size classes. Timber quality in the Anthracite region is probably below average for this area because of the preponderance of small trees and of past fire history.

A major portion of the largest single watershed in the Northeast occurs here, the Susquehanna (whose acreage is slightly more than the combined areas of Massachusetts, Vermont, and New Hampshire), and the upper third of the adjoining Delaware River watershed. Both watersheds are sources of metropolitan water supplies for one of the greatest concentrations of people and industrial development in the United States. On the other hand, this is also one of the highest flood-damage zones in the country in terms of dollar losses.

Therefore, the management of forested watersheds is one of the most important research problems for the Kingston Center. The problem has two major aspects: flood control and, paradoxically, increasing the supply of water for public uses.

#### MAJOR RESEARCH FACILITIES

Two experimental forests are used by the Kingston Center. These are:

1. The Delaware-Lehigh Experimental Forest, near Blakeslee, Pennsylvania, acquired in 1948 by the Pennsylvania Department of Forests and Waters for cooperative research in watershed

management and scrub oak conversion. This forest is about 2,000 acres in extent and has an elevation of approximately 2,000 feet. Except for a fringe of timber along Dilldown Creek, the forest type is scrub oak with a scattering of pitch pine. Terrain is relatively flat except for its main topographical feature, Mt. Pohopoco, locally known as Pimple Hill--a most descriptive name.

A major part of the forest, 1,530 acres, is the drainage for Dilldown Creek. Streamflow is measured by a Columbus deep-notch weir maintained by the U. S. Geological Survey and the Department of Forests and Waters. Here, the water yields of scrub oak will be compared with yields from high forests obtained from conversion practices being developed jointly by the State and the Station.

2. The Pocono Experimental Forest, established in 1948 near Gouldsboro, Pennsylvania, under a cooperative agreement with the Monroe Water Supply Co., a subsidiary of the Lehigh Coal and Navigation Co.

The Pocono contains 2,000 acres of northern hardwoods and is located in relatively level Pocono Plateau country, lying about 2,000 feet above sea level. The soil is of glacial origin and is quite rocky.

An area in the middle of the experimental forest, 560 acres in extent, is devoted to watershed management research. Streamflow from the watershed is measured by a Columbus deep-notch weir across the West Branch tributary of the Lehigh River. The rest of the Forest is used for research in applied silviculture, management methods and other timber production problems.

Headquarters improvements include two Quonset buildings, one a combined garage and workshop; the other serves as an office and bachelor quarters.



## CENTER PROGRAM

Major forest types in which work is being done: northern hardwood, scrub oak.

### Major research projects

1. Compartment management study, northern hardwood type, (50 percent of time); this is a curtailed version of a study originally comprising 30 compartments; now restricted to 15 compartments. Main variables: management system (tree selection, diameter limit, shelterwood, clear-cut strips), length of cutting cycle, supplemental cultural treatments. This study from the beginning has been plagued by blow-downs and excessive deer damage.
2. Forest-wildlife relationships (20 percent of time); studies here include 5 fenced-exclosure installations, a fenced clear-cut strip as a compartment treatment, a study of the protective effects of slash upon tree reproduction, and other informal studies.

Other activities (20 percent of time spent on items 1-3 below, 10 percent on items 4-5).

1. Two farm woodland demonstrations (northern hardwood).
2. CPL plots (northern hardwood).
3. A thinning study (4 intensities) in a pole-size oak stand.
4. Informal seeding and planting studies in the scrub oak type.
5. Cooperation with headquarters in various planting and silvicide studies in the scrub oak.

PERSONNEL

Permanent

1. Name: Irvin C. Reigner (Irv)

Title: Research Center Leader

Current Assignment: Center Leader, WM Project Leader -  
35% FM, 65% WM

Major Professional Interest: WM - instrumentation, watershed calibration, interception; FM - Scrub Oak Conversion, Regeneration

Formal Education and Training: BSF The Pennsylvania State College, 1938; MF Duke University, 1948; Army of the U.S. April 1943 to December 1945. Twenty three mos. in European Theater of Operation, Italy, Corsica, France and Germany

1938-1939  
Experience: 4 mos. - Flood Control Division, Pennsylvania Dept. of Forests & Waters; 1939-1940, 9 mos. - U.S. Forest Service, NEFES, Mass.; 1940-1941, 12 mos. - Plunkett-Webster Lumber Co., Inc., Asst. Sales Mgr.; 1941-1946 - U.S. Corps of Engineers, Surveys, Construction Inspection and Layout; 1946 - U. S. Forest Service, Forest Survey, WM research, Delaware Basin Research Center and Kingston Research Center

2. Name: Ted Joseph Grisen (Ted)

Title: Project Leader

Current Assignment: Compartment management, deer problem - FM

Major Professional Interest: FM - hardwood silviculture, forest-wildlife relationships

Formal Education and Training: Ohio State University; University of Michigan (B.S. in Forestry); Statistical courses A and B; U. S. Army, May, 1943 to Dec. 1945 including 22 months in England, France, and Germany

Experience: Joined U. S. Forest Service July 1, 1946; 1946-1952, Forest Survey in Maine, New Hampshire, Pennsylvania, New York, West Virginia, Maryland, and Massachusetts; 1952-1955, FM Research, Penobscot Research Center; 1955- FM Research, Kingston Research Center.

3. Name: Arthur Richard Eschner (Art)

Title: Forester (Forest Influences)

Current Assignment: Watershed Management - 10% FM, 90% WM

Major Professional Interest: Watershed Management

Formal Education and Training: State University of New York, College of Forestry, B.S.; Iowa State College, M.S.; Statistical seminar - 1956; 2½ years as a Navy Hospital Corpsman (lab. technician), 1943-1946, stationed at Norfolk, Va.; Pensacola, Fla.; Guam M.I. and Okinawa

Experience: 1949, 2 mos. - N.Y. State Conservation Dept. Div. of Lands & Forests, surveying; 1949, 1½ mos. - USDA SCS, Conservation Aid - Student Trainee, farm planning; 1950-52, 30 mos. (half time) Iowa Agricultural Experiment Sta., Forestry Section - forest management research; 1953-54, 14 mos. - Forest Survey, CSFES; 1954 - Kingston Research Center, Vicksburg project and watershed management research. Joined Forest Service April 6, 1953.

4. Name: Edward Anthony Sowa (Ed)

Title: Clerk-typist

Current Assignment: Clerical duties at Kingston Research Center  
40% FM - 60% WM

Formal Education and Training: 20 months with U. S. Army Amphibious Engineers including 10 months service in New Guinea and Dutch East Indies; 4 yrs. high school

Experience: 1942-1943, 23 mos. - set up man, Fafnir Bearing Co; 1946-1954, 8½ years - Veterans Administration, receptionist, travel clerk. Joined Forest Service Sept. 13, 1954.

5. Name: Willis Taft Borneman (Bill)

Title: Forestry Aid

Current Assignment: FM & WM forestry aid - 80% FM, 20% WM

Formal Education and Training: 1½ yrs. high school; USDA correspondence course 1 yr. - Fam Forestry; 13 years U.S. Army; 5 yrs. C.C.C.; New England Timber Salvage 2 yrs.

Experience: 1949-1950 NEFES Hopkins Memorial Forest FM; 1952 - 4 mos. Frost Study, Depost, N.Y.; 1955 - 4 mos. Beltsville, Md. NEFES Hybrid Poplar; 1956 - Pocono Experimental Forest, FM WM. Joined FS 10/4/48.

Summer Assistants

1. Gordon Luckenbaugh, GS-3, Penn State
2. Louis Shain, GS-4, Penn State

Mountain  
State

## THE MOUNTAIN STATE RESEARCH CENTER

The Mountain State Research Center, with offices in Elkins, West Virginia, conducts the Station's research program in timber and forest watershed management in the Appalachian Hardwood forests of the Northeast. The following sections describe briefly these forest types and their research problems as well as the experimental forests the Center uses and gives information about Station personnel assigned to this field office.

The Mountain State Research Center was established July 1, 1948 as a branch of the Northeastern Forest Experiment Station to conduct research in timber and watershed management problems of the Appalachian forest types. The rugged topography on which these types occur creates special problems in timber management, in logging techniques, and economics, and in watershed management. Soils are shallow and derived from unglaciated sandstones and shale.

As a result of steep topography, shallow soils, and abundant rainfall, forests occupy approximately two-thirds of the Appalachian section in the Northeast. In addition,  $1\frac{1}{2}$  million acres of open land should probably revert to forest. These potential forest lands are largely composed of sub-marginal cropland, worn-out pasture land on steep and eroded slopes, and coal-mined areas. The bulk of the commercial forest land is in private ownership; industrial and other private, 60 percent; farm forests, 31 percent; public, 9 percent.



For simplicity, the Appalachian forests of the Northeast may be considered as: (1) cove types, consisting of a mixture of yellow-poplar, black cherry, red oak, and sugar maple--the most valuable species; (2) oak types; (3) northern hardwoods; and (4) mixed hardwood--softwood types.

The timber resource is a major feature of the economy. Forests also protect the headwaters of the important streams. The Potomac River and two main branches of the Ohio system--the Monongahela and the Great Kanawha--originate in this area. The value of forest land for recreation, wildlife and the production of game and fish is steadily increasing.

#### MAJOR RESEARCH FACILITIES

The Fernow Experimental Forest, located 2.5 miles south of Parsons, West Virginia, was set aside for research in 1934 in the Cheat Ranger District of the Monongahela National Forest. A limited program of research was carried on here by the Appalachian Forest Experiment Station until World War II. The present program was initiated in July 1948 by the Northeastern Forest Experiment Station. The Forest, covering 3,640 acres of second-growth Appalachian hardwoods, is well suited as a field laboratory for timber and watershed management research because its past cutting and fire history, rugged topography, cover types and conditions are representative of much of the northern Appalachian forests.

Headquarters of the Fernow are located near Parsons on National Forest land. They consist of the following: an office building with facilities for 8 men, a combined conference and exhibit room, and second story storage; a lodge; a residence; a small soils lab; and garages for 8 cars.

While most of the Center's studies have been conducted on the Fernow Experimental Forest, an increasing amount of research is being carried on throughout the northern Appalachian forests. To meet the need for facilities for additional research, a 2,500 acre experimental forest has been designated on land of the Union-Carbide-Olfins Company near Charleston, West Virginia. Research in timber production, watershed management and perhaps other fields of forestry will be carried out jointly there by the Northeastern Forest Experiment Station and the Union-Carbide-Olfins Company. This work is authorized by an agreement completed by the Station and the Company during 1957.

## CENTER PROGRAM

Major forest type in which work is being done:  
Appalachian hardwoods--predominantly oak types.

### Major research projects:

1. Compartment management study (30 percent of time);  
13 compartments, each a sub-watershed, 11 under  
all-aged management and 2 under even-aged management.  
Main variables: 4 cutting practice levels, 4 cutting  
cycles, 3 levels of growing stock, 2 product  
objectives.
2. Remeasurement of plantings on bituminous spoil banks,  
made some 10 years ago by Penn State College of  
Forestry, and preparation of project analysis (20  
percent of time).
3. Site index studies on oaks; presently testing the  
validity, on limestone soils, of the equation developed  
for acid soils (15 percent of time).
4. Cooperative study with Union Carbide-Olfins Co.,  
installing sets of 6 cutting-practice-level plots  
on 2 qualities of site (10 percent of time).

### Other activities (25 percent of time)

1. Farm woodland demonstration - 2 units
2. GPL plots
3. Study of deer damage and deer population in relation  
to cutting practice level (in cooperation with West  
Virginia Game Commission).
4. Stand stocking study.
5. Study of white pine under-planting (oak overstory)
6. Hybrid poplar clonal test
7. Silvicides for TSI--test of Veon 100

PERSONNEL

Permanent

1. Name: George Richardson Trimble, Jr. (Dick)

Title: Research Center Leader

Current assignment: Research administration at the Mountain State Research Center, Elkins, W. Va. - 50% F.M., 50% W.M.

Major Professional Interest:- Forest site studies

Formal Education and Training: University of Idaho (Forestry) 1931-1932; University of Maine (B.S. Forestry) 1937; Univ. of Georgia (English and Public Speaking ) Summer 1935; University of Delaware (Graduate work in soils, taxonomy, and statistics) 1950; Davis and Elkins College (Hydraulics) 1951; Duke (Graduate work in forest soils) Summer 1952. Correspondence courses: Weather elements - 1953; Statistics - 1954. Forest Service Statistical Seminar - 1958

Experience: 1932, Fall- U.S. Forest Service; 1932, 3 months - White Mountain NF, timber cruising; 1933-34, 16 months - White Mountain NF, forestry foreman in CCC Camp; 1936, 4 months - Green Mountain NF, timber cruising; 1937-39, 2 years - Green Mountain NF, forest guard and forestry foreman in CCC Camps; 1939-43, 4 years - Northeastern Forest Experiment Station, timber tax survey in New Hampshire, study plot remeasurement throughout New England, resident superintendent at Gale River (N.H.) and Massabesic (Maine) Experimental Forests, Woodlot management at Cooperstown, N. Y., farm woodlot research in Connecticut, flood control survey (Connecticut River); 1943-46, 30 months - Rubber Development Corporation, explorer and rubber technician in the Upper Amazon Valley of Brazil; 1946-Present, 12 years - Northeastern Forest Experiment Station; flood control surveys (4 years in Upper Darby); Project Leader in watershed management research at Mountain State Research Center in W. Va. (4 years); Project Leader in watershed management research at White Pine-Hardwood Research Center in New Hampshire (3 years); Research Center Leader at Mountain State Research Center in W. Va. (1 year).

2. Name: Wilfred Charles Mitchell (Mitch)

Title: Research Forester

Current Assignment: FM - compartment management, timber quality estimates.

Major Professional Interest: Stocking levels and stand structure, natural regeneration, timber quality estimates, logging methods, forest site

Formal Education and Training: B.S. Forestry - University of Maine 1956; National Hardwood Lumber Inspection Training School 1951; Served U.S. Army September 1946 to January 1948 - occupation of Japan

Experience: Joined U.S. Forest Service July 1956 - 18 months FM research, Mountain State Research Center; 1951-52 - 19 months - Northern Lumber Co., Poland, N. Y., inspection and measurement of hardwood lumber.

3. Name: George Emerson Hart

Title: Research Forester

Current Assignment: Strip-mine revegetation and compartment management with emphasis on natural regeneration

Major Professional Interest: Stocking levels, soil moisture relationships, plantation management

Formal Education and Training: Yale University, B.A. 1951; University of Michigan, B.S. and M.F. 1956; U.S.D.A. Graduate Course: Sampling and Experimental Design, currently working; 1951-1953, 2 years, - U.S. Air Force, 1 year in Korea.

Experience: 1955, 3 months - Research aid, Biological Station, University of Michigan; FM and WS, Mountain State Research Center, 1956 to present.

4. Name: Harry Wolodymyr Yawney

Title: Forester

Current Assignment: FM - site study, growing stock levels, white pine underplanting

Major Professional Interest: FM - site studies, stocking, stand structure, natural regeneration

Formal Education and Training: Pennsylvania State University, B.S., School of Forestry, 1955; Pennsylvania State University, M.S., 1957; U. S. Marine Corp., Feb. 1956-Nov. 1947; U. S. Marine Corp Reserve, Sept. 1950-July 1952 - Korea, 10 months

Experience: 1955, 1 year - Deschutes National Forest, Oregon, timber sales; 1957, 8 months - Fernow Experimental Forest, silvicultural studies.

5. Name: Carl Robert Barr

Title: Logging Superintendent

Current Assignment: In charge of logging job on Fernow Experimental Forest; safety officer and fire control officer. In charge of automotive and building maintenance, grounds, and all construction

Major Professional Interest:- all phases of forest management

Formal Education and Training: High school

Experience: 1924-31 - worked on logging operations with several private companies; 1931-1932 - U.S. Forest Service, fire fighter and patrolman; telephone maintenance and road maintenance; 1933-1934 - U. S. Forest Service - telephone line foreman - CCC Camp; 1934-1935 - U.S. Forest Service - silvicultural foreman - CCC Camp; 1935-1941 - U. S. Forest Service - general foreman; safety officer; 1941-1943 - With Army - employed by the Forest Service as a training officer in fire control for area including Eastern Shore of Maryland, Virginia, Delaware and southern New Jersey; 1944-1945 - U.S. Forest Service - Army maneuver area. Fire control with the Army; 1945-1949 - Cheat Ranger District, Monongahela National Forest - General District Assistant. In Charge of all planting projects on the Monongahela; fire control; timber marking and sales; and supervising work of lookouts and guards; 1949-present - Northeastern Forest Experiment Station, Fernow Experimental Forest, Parsons, W. Va., Forestry Aid.

6. Name: Kathleen Piercy Hammack

Title: Clerk-Stenographer

Current Assignment: Mountain State Research Center - Clerk - 60% FM, 40% WM

Major Professional Interest: Compartment management records

Formal Education and Training: Elkins High School, Elkins, W. Va. - 1933; West Virginia Business College, Clarksburg, W. Va. - 1934

Experience: 1935-1939 - Works Progress Administration, Elkins, W. Va. - Secretary to Finance Supervisor and fiscal work; 1939-1947 - Soil Conservation Service, Moundsville, Clarksburg, Martinsburg and Romney, W. Va. - Work group clerk; 1947-1951 - Department of Public Assistance, Elkins, W. Va., District Finance Officer; 1951-present - Northeastern Forest Experiment Station, Mountain State Research Center, Clerk, Elkins, W. Va.



Summer Assistant

1. Robert Adams, GS-4, University of W. Va.

Penobscot

## THE PENOBSCOT RESEARCH CENTER

This field office, with headquarters in Bangor, Maine, conducts the Station's timber management research program in the spruce-fir and associated northern hardwood types. These forest types and their timber management problems as well as the experimental forests used by this Center are briefly described below. Information about the Station personnel assigned to this field office follows these descriptions.

The spruce-fir region of the Northeast includes over 15 million acres. It is unique in the East because of its continuous, vast expanse of timberland with very low population. In fact, Maine, with 80 percent of its area in forest land, has the highest proportion in forest of any state in the country.

In the spruce-fir type 88 percent of the land is commercial forest land, only 10 percent is in farm forests, and an almost negligible amount is in public ownership. Thus, it is only natural that the economy of this area is tied directly to the forests. The 19th century saw white pine as king, and the lumber industry boomed. Now, the pulp mills have taken over, putting the spruce-fir region on a pulpwood economy. Today, in the State of Maine, wood-using industries top all others, employing one-third of the working force and producing one-third of the manufactured products.

Besides the switch from a lumber to a pulpwood economy, another more recent change has taken place. The almost exclusive concentration on spruce and fir for paper manufacture has given way to increased interest in hardwood utilization. This has resulted in changes of mill processes, forest management, and logging operations.

Research has been concentrated on management of spruce-fir forests, but is being expanded to meet needs associated with the increased use of hardwoods. Research in hardwoods will, at least initially, emphasize planting, natural regeneration, and management of birch in the spruce-fir region.

#### MAJOR RESEARCH FACILITIES

1. The Penobscot Experimental Forest, located near Bradley, Maine, was established in February, 1951, when nine timberland owners purchased the land and leased it to the Station for the purpose of research. The purchase of additional, access land in 1957 increased the total area to 4,000 acres. The Forest is comparatively level and contains several small, swampy areas. It serves as the principal field laboratory for the Research Center and is used for research in silviculture, management, and related fields. Most of the tract has been made accessible by constructing gravel roads. Physical facilities consist of a combination garage and office and an oil and gas house.

2. The Gale River Experimental Forest, near Bethlehem, New Hampshire, was set aside for research in spruce-fir management during February, 1931. It is located on the White Mountain National Forest. Most of the experimental plots and study areas were damaged beyond hope of salvage by the hurricanes of 1938 and 1950. Early in 1958, all but 150 acres of the original 1,320 was returned to the White Mountain National Forest. The remaining area will be returned to the National Forest as soon as research in progress has been completed.

## CENTER PROGRAM

Major forest types in which work is being done: spruce-fir.

### Major research projects

1. Compartment management study (25 percent of time); 28 compartments, all of which have been cut at least once. Main variables: management system (tree selection, shelterwood, clear-cut), cutting practice level, cutting cycle, product objective (pulpwood only, integrated use).
2. Growth studies (25 percent of time); converted budworm cutting plots; cooperative growth study supported by 10 timberland-owning companies (both spruce-fir and associated hardwood types).
3. White birch studies, new in 1958 (15 percent of time); a planting study and a study of effects of seed bed treatments on natural regeneration.

### Other activities (35 percent of time).

1. Pruning and thinning studies; pruning studies deal with costs and returns, as well as with biological relationships--crown length and crown space in relation to growth.
2. Tree classification study--determination of external indicators of fast future growth.
3. Study of regeneration following the Beddington burn.
4. Studies of fir mortality and the role of the woolly aphid.
5. Seed crop surveys (regional)
6. Several other small, informal studies.



## PERSONNEL

### Permanent

1. Name: Franklin R. Longwood (Frank)

Title: Research Center Leader

Current Assignment: Administration of Penobscot Research Center

Major Professional Interest: Forest management, utilization, and tropical forestry

Formal Education and Training: B.S. Michigan State University; M.F. Oregon State College

Experience: 1937 - Fire Guard, Shasta National Forest, Cal.; 1938 - Ass't Chief of Party, Timber Survey Project, Medicine Bow National Forest, Wyoming; 1939 - 1 month, Field Ass't, Pacific Northwest Forest Experiment Station, 3 months Chief of Party, Timber Survey Project, Medicine Bow National Forest, Wyoming; 1940 - 3 months, Weyerhaeuser Timber Co., reforestation project in Washington; 3 months as "expediter" at Moore Dry Kiln Co., No. Portland Oregon; 1941-1942 - Fire Dispatcher, etc., Manistee National Forest, Michigan; 1943 - Ass't District Ranger, Baldwin District, Manistee National Forest, Michigan; 1944 - Farm Forester, Ames, Iowa; 1947 - Research Forester, CSFES, Ames, Waukon and McGregor, Iowa, in charge of Forest Management Research at the Paint Creek Experimental Forest; 1949 - Research Forester (Forest Management), LSFES, Marquette, Michigan; 1954 - Project Leader (Forest Utilization Research) Tropical Forest Experiment Station, Puerto Rico; 1956 - Research Center Leader, Penobscot Research Center, Bangor, Maine.

2. Name: Arthur Clifford Hart (Art)

Title: Research Forester

Current Assignment: FM - compartment management, small woodlot management

Major Professional Interest: Silviculture and management

Formal Education and Training: University of Connecticut, BS, 1936; Yale School of Forestry, MF, 1938; Statistical Seminar, Washington, D. C., 1947-1948; U.S. Army 1944-1945, Engineer basic, OCS, Mechanical Equipment School; 1945 - USAR (Engr. refresher 1956, CAMG School 1957-1958)

Experience: 1937, 3 months, NEFES Forest Fire Damage Study;  
1938-1939, 10 months, Massabesic Experimental Forest, FM research;  
1939-1941, 15 months, Gale River Experimental Forest, FM research;  
1941-1943, 22 months, Childs-Walcott Estate, F.M.;  
1943-1944, 10 months, Rubber Development Corp., rubber  
exploration in Brazil and Bolivia  
1944-1945, 21 months, U.S. Army (8 months - American Cinchona  
Plantation, Costa Rica, logging);  
1945-1946, 6 months, Illinois Natural History Survey, extension  
Forestry;  
1946-1948, 28 months, NEFES Gale River Experimental Forest, FM  
research  
1948 Penobscot Research Center, Bangor, Maine, FM research

3. Name: Grant Davis

Title: Research Forester

Current Assignment: Compartment Management, Timber Stand Im-  
provement

Major Professional Interest: Ecology (Animal and Plant) Timber  
stand improvement, logging engineer

Formal Education and Training: B.S. Forestry, 1949, Pa. State  
University; M. S. Wildlife Management, 1951, Pa. State Univ.;  
U. S. Forest Service, NEFES - Statistical Seminar, 1956; U. S.  
Army 1945-1946, Military Intelligence, Baltimore, Maryland;  
U. S. Navy Reserve (1956 to present), Lt. jg. in Naval In-  
telligence. Returning to school in fall of 1959 to work  
toward Ph.D

Experience: 1948, 3 months, Allegheny National Forest, Timber  
Stand Improvement; 1949, 3 months, Penna. Game Commission,  
Research; 1951-1955, Ochoco National Forest, Prineville, Oregon,  
Timber Management, fire suppression and general administration;  
1955 to present, FM Research, Penobscot Research Center, Bangor,  
Maine.

4. Name: Samuel Mitchell Brock (Sam)

Title: Research Forester

Current Assignment: FM-Compartment Management

Major Professional Interest: Statistical methods, sampling pro-  
cedures, forest economics

Formal Education and Training: 2-1/4 years at Northwestern University - pre-medical course; 5 semesters at University of Michigan - B.S. 1956, M.F. 1956, Forestry. Returning to school in fall of 1959 to work toward Ph.D

Experience: Joined Forest Service in June 1956 - 13 months forest survey field work; 5 months work on statistical analyses; 4 months computation on forest management studies.

5. Name: Orman Russell Carrolll

Title: Labor Foreman I

Current Assignment: Superintendent of Penobscot Experimental Forest

Formal Education and Training: Graduate of Old Town High School; U. S. Army Corps of Engineers, Combat Battalion, ETO, WWII, Rating T/4

Experience: 1950-1955, Maine Forest Service, Fire Warden; 4 years lumbering experience; U. S. Forest Service, November 1957 to present.

6. Name: Marilyn Charlotte Abbott

Title: Clerk-Stenographer

Current Assignment: Clerk-Stenographer, Penobscot Research Center, Bangor, Maine

Major Professional Interest: Business Management

Formal Education and Training: Old Town High School; Husson College, Degree in Secretarial Science, 1956

Experience: 1954, Summer, University of Maine, Department of Agricultural Economics - Secretary; 1955, Summer, L. V. Vafiades, Attorney, Legal Secretary; 1956, Summer, Travelers Insurance Co., Bangor, Maine, Secretary. 1956, September 10 to present, joined Forest Service, Penobscot Research Center, Bangor, Maine. (All employment in Bangor, with the exception of summer employment at the University of Maine, Orono, Maine.

#### Summer Assistants

1. Donald Edwards, GS-3, University of Maine
2. Robert Bauer, GS-3, University of Maine

*See Wilson*

Virginia  
Pine-Hdwd.

## THE VIRGINIA PINE-HARDWOOD RESEARCH CENTER

This field office has its headquarters near Laurel, Maryland, on the Agricultural Research Center area of the Agricultural Research Service. Research is conducted here in timber management methods for the Virginia pine and hardwood (predominantly oaks) types of the piedmont sections of the Northeast, in tree physiology, in forest tree diseases, and in forest insects. Information follows about the Station's program at this Center, research problems in the Virginia pine-hardwood types, research facilities available to the Center, and the Station's personnel assigned to the Center.

Topography of the piedmont section of the Northeast is generally gentle to rolling and presents no obstacle to logging or management operations. Other characteristics that favor good forest practices are: (1) a favorable year-around climate; (2) a dense network of roads and railroads; (3) close, reasonably stable markets; and (4) a variety of good timber species.

The piedmont section contains about 8.8 million acres of commercial forest. Farm forests account for 42 percent of the forested land. The average farm woodland contains about 27 acres and returns less than a \$1.00 per acre per year--far below the potential of a well managed forest.

Conifers, though covering 37 percent of the forested area, comprise only one-seventh of the total (67.8 million cords) growing stock. Virginia pine, the principal conifer, generally grows

on the poorer sites. It occurs in pure stands on old fields or severe burns but more often is found in mixtures with the upland hardwoods. The demand for pine pulpwood continues to be strong and promises to increase. Increasing the Virginia pine component of mixed stands, a difficult technical job, is a principal research objective of this Center.

Hardwoods found on the intermediate sites are mostly oaks, hickories and sweet gum. These account for over one-half of the hardwood growing stock volume. One quarter of the total hardwood volume is in the more valuable species, principally white oak and yellow poplar, and occurs on the better sites. These latter species are in good demand. Improving the quality of intermediate site hardwoods and increasing hardwood markets, are first steps in obtaining a better balance between production and utilization of these species.

Most of the upland soils of the northern Piedmont are subject to sheet erosion, heavy siltation of streams and water impoundments is common. The continually increasing demand for water for both industrial and human consumption emphasizes the need for better watershed management practices.

Disease problems include chestnut blight, sweet gum blight, red ring rot, and decay in several wood products. The more important of the injurious forest insects are the pine



sawfly, Ips beetles, tip moths, cone insects, and the old house borer. Research leading to control methods for these pests is underway at this Center.

#### MAJOR RESEARCH FACILITIES

The major facilities available to this Center are:

1. The Beltsville Experimental Forest. This 3,000-acre tract was allocated to the Forest Service for research by the Agricultural Research Service in 1934. It is used by the Center primarily for studies and demonstrations in forest management.
2. A combination office and laboratory building that provides offices for the research staff, a small laboratory, a walk-in cold room and a dark room suitable for simple photographic work.
3. A lodge that provides quarters for temporary field assistants, visiting Forest Service officers, and facilities for conferences, meetings and training courses.
4. Three homes for resident staff members and their families.
5. Several smaller buildings that are used for garages, repair work and storage.

Locally, opportunities for cooperative research are numerous. The Fish and Wildlife Service has a large research unit next to the Experimental Forest where assistance with biological problems can be obtained. Also, the adjacent Agricultural Research

Center has many research specialists in such fields as botany, entomology, physiology, ecology, hydrology, soils, field crops, herbicides, agricultural engineering, biometry, horticulture, genetics, radiology and mycology. The nearby University of Maryland has active research programs in mineral nutrition, genetics, and entomology; also the Maryland Soils Testing Laboratory and the State Entomologist are located here. The Maryland State Forest tree nursery is a short distance from the Center and offers opportunities for research in tree seed and nursery practices. From time to time specific studies are conducted in cooperation with these several state and federal groups.

## CENTER PROGRAM

Major forest types in which work is being done: Virginia pine and Virginia pine-hardwood.

### Major research projects

1. Studies of a basic character in light and nutrient relationships of tree seedlings: Snow's studies with 27 species under different photoperiods and nutrient levels; 1958 study of effects of various levels and intensities of supplemental light on 3 species; Sucoff's thesis project on minimum requirements of loblolly and Virginia pine seedlings for K, Ca, and mg; other informal and cooperative studies (50 percent of time).
2. Compartment management study: 33 compartments--12 Virginia pine type, 21 pine-oak. Main variables: management system (strip, seed tree, patch, and clear cuttings), four cutting practice levels or intensities of management, two product objectives (pulpwood, pulpwood and sawlogs). (20 percent of time)
3. Genetics: clonal tests and other studies with hybrid poplars (10 percent of time)

### Other activities (20 percent of time)

1. Farm woodland demonstrations (2 units)
2. CPL plots
3. Cooperative study with West Virginia Pulp and Paper Company dealing with seedbed and hardwood control treatments to favor regeneration of Virginia pine.
4. Bud pruning study on Virginia pine.
5. Other minor studies in regeneration and silviculture--planting, chemical debarking, prescribed burning.

PERSONNEL

Permanent

1. Name: Albert Granville Snow, Jr. (A1)

Title: Research Center Leader

Current Assignment: Research Administration, - 92% FM,  
5% WM, 3% FIR

Major Professional Interest: Research administration,  
silvics, primary research all fields

Formal Education and Training: Washington State College,  
BS 1933 in Forestry and physiology; Yale, MS 1935 in  
tree physiology and forest pathology; WO statistical  
course 1938. Statistical seminar Conn. Agric. Exp. Sta.  
1940; Plant Industry Station 1954. Field course in  
Forest Soils of Florida, Univ. of Florida 1948. Training  
in management (TAM), USDA Philadelphia Work Shop 1954.  
Audited formal course in LIGHT, Graduate School Univ. of  
Maryland 1957.

Experience: 1927-1933 incl. 3 mos. each year in field on  
research (PNW) and administration (R6) in forests of the  
northwest on plot establishment and measurements, fire  
guard, look out, assistant Ranger, timber cruising and  
mapping, 1934, summer at Appl. FES on fire studies.  
1935-1942 NEFES, New Haven, Conn., on spruce management  
and forest genetics. 1942-1952 SEFES, Lake City, Fla.,  
on Naval Stores. 1952 to date NEFES at VPHRC Laurel, Md.

2. Name: Richard H. Fenton

Title: Research Forester (Forest Management)

Current Assignment: Compartment and small woodland manage-  
ment; utilization studies; regeneration - natural and  
artificial, - 95% FM, 5% WM.

Major Professional Interest: Plantation studies; tree im-  
provement investigations; logging methods and techniques;  
stand and type conversion

Formal Education and Training: BS, University of Conn., 1933;  
MF Yale School of Forestry, 1939; 2 statistical seminars.  
Served in U. S. Navy, 1944-46; Lieut. in motor torpedo boat  
squadron.

Experience: Rodman, U. S. Geological Survey 1933 in Conn.; fieldman Resettlement admin. 1934 Conn.; Jr. Forester CCC Camps 1935-1937, Maryland; Log Grader and scaler, NETSA, 1939-1940, Conn.; Inspector, Pratt-Whitney Aircraft Co., Conn.; 1940; Landscape Architect, Corps of Engineers, Rhode Island 1941-1944. Joined NEFES March 1946 following Naval service, as forester working on forest drain studies, Laconia, N. H. 1946-1947. 1947-1951 Research Farm Forester in Conn., on small woodland management, wood preservation, charcoal manufacture, chipped wood studies. 1951 - Va. Pine-hardwood Res. Center, Laurel, Md., as Research Forester principally on compartment management and logging studies.

3. Name: Edward I. Sucoff

Title: Research Forester

Current Assignment: Mineral Nutrition, Virginia pine regeneration

Major Professional Interest: Tree physiology

Formal Education and Training: University of Michigan, BS, 1955; MS 1956; currently working for a PhD in Botany at the Univ. of Maryland

Experience: Weyerhaeuser Timber Co. - Research 6 weeks 1955. Joined Forest Service July 1956.

4. Name: Harold F. Ford

Title: Project Leader

Current Assignment: Forest genetics, administrative work; Superintendent Beltsville Exp. Forest - 90% FM, 5% WM, 5% FIR

Major Professional Interest: FM - Hybrid poplar clonal tests

Formal Education and Training: Teacher's training class, Fillmore, New York 1931; Statistical Seminar 1952. U. S. Army - Field Artillery and Combat Engineers 1944

Experience: 1935-37, USCCC, TBI and administrative work; 1937-38 USFS Timber cooperative, Tioga, New York Project, timber cruising, computation work; 1938-40, NEFES, Hopkins Memorial Forest, Williamstown, Mass., forest genetics nursery, 1943-44 Allegheny Forest Experiment Station, RPS work; 1945, 6 mos. NEFES, RPS work; 1945-present, Virginia Pine-Hardwood Res. Ctr., forest genetics and administrative work.

5. Name: Ralph Pennell Broomall (Pen)

Title: Forestry Aide

Current Assignment: Harvest cuttings, regeneration, prescribed burning, automotive maintenance - 95% FM, 5% FIR

Major Professional Interest: Planting, surveying, cruising

Formal Education and Training: High school; Penn State School of Forestry - 2 years. Logging school of Fernow Experimental Forest

Experience: Nursery work, New Jersey, 1930-35; NEFES: 1935-36, Stone Valley Exp. Forest, Huntingdon, Pa.; 1936-1958, Beltsville Exp. Forest, Laurel, Md.

6. Name: Sumner Franklin Ricker

Title: Forestry Aide

Current Assignment: Harvest cuttings, inventories, planting, prescribed burning - FM

Major Professional Interest: Seed production and natural regeneration; logging methods

Formal Education and Training: High School; correspondence course in business methods; logging school at Fernow Exp. Forest

Experience: 1927-32, RFDmail carrier, Maine; 1932-1940, self-employed; 1940-1946, Todd-Bath Shipyards, Portland, Maine; 1946-1947, ranching in Calif.; 1947-1951, NEFES: Massabesic Exp. Forest, Forestry Aide; 1951-1958, Forestry Aide, Beltsville Exp. Forest.

7. Name: Eunice L. Berrang

Title: Clerk-Typist

Current Assignment: Secretary - 70% FM, 10% WM, 20 FIR

Major Professional Interest: None

Formal Education and Training: Brevard Jr. College, Brevard, N. Car., USDA course in Foreign Relations

Experience: 1942, 9 mos., Office Chief of Finance, U. S. Army; 1942-44, Republican National Committee; 1950-56 - U.S. Geological Survey, Department of the Interior; 1956-57 - Barber and Ross Structural Steel Co.; joined Forest Service 1958.

Summer Assistants

1. Enn-Vello Abel, GS-5, Yale
2. Walter Bavarskas, GS-5, Univ. of Conn.
3. Samuel Becker, GS-5, Penn State
4. Joseph Brade, GS-2, Penn State
5. Joseph W. Graham, Jr., GS-3, Univ. of West Virginia



White Pine-Hdwd.

## THE WHITE PINE-HARDWOOD RESEARCH CENTER

This field office is located at Laconia, New Hampshire (Fig. 1). The Center conducts a part of the Station's research program in the white pine and the northern hardwood types. The major lines of research here are: (1) timber management, including genetics, hardwood planting, soil-site-growth relationships and tree physiology; (2) forest watershed management; and (3) forest tree diseases. Characteristics of the white pine and northern hardwood types are briefly described below. Also, information follows about the research facilities used by this Center and the Station personnel assigned to it.

White pine and northern hardwoods are the dominant forest types in the White and Green Mountains of Central and Northwestern New England. Spruce-fir and several other hardwood types are quite commonly intermingled with the white pine and northern hardwood forests.

More than 5 million people live and work in the white pine-northern hardwood section of the Northeast. Although nearly 40 percent of the employed labor force work in the manufacturing industries, the forests are important in the economy. Wages in the wood-using industries are one-fourth of the total paid. A substantial year-round recreation business has been developed. However, water is unquestionably the No. 1 resource. Although largely taken for granted in the past, the

constantly increasing demands for industrial, domestic, and recreational use have pointed up the importance of water throughout the region. The headwaters of important New England rivers are in the White and Green Mountains.

In general, the land is rolling. Rugged, mountainous country is centered around the Presidential Range of the White Mountains, whereas the gentlest topography is found in the vicinity of Lake Champlain. Elevations range from sea level to 6,288 feet--the top of Mt. Washington. The climate is cool and humid with long, cold winters and short, cool summers. The frost-free period lasts for roughly 110-200 days depending on the elevation. Precipitation, much of it snow, ranges from around 30 to 40 inches with greater amounts in some localities.

Forests cover two-thirds of the land area--some 13 million acres. Only about a million acres are publicly owned; the remaining 12 million acres is mostly in small holdings. The land use pattern is pretty well stabilized. The abandonment of land for agricultural use still continues at a slow pace. To a considerable extent, this is offset by increased use of forest land for urban development, highways, airfields, water reservoirs, and similar needs.

Hardwood types are the most extensive. About 43 percent of the forest area is in the sugar maple-beech-yellow birch type. But softwoods are also commercially important. White pine, either pure or in mixture with other species, occupies

19 percent of the forest land. The remaining forest area is divided among the aspen-birch-pin-cherry type, hardwood-spruce-fir type, oak types and others.

In general, the forests are depleted. Sawtimber stands are found on only about 4 out of 10 acres of forest land. The remaining forest acreage is in poletimber and younger stands that need tending now or in the near future; about 10 percent of this area is poorly stocked and may be suitable for planting. Quality of the timber is low. For example, about three-fourths of the hardwood sawlog volume will not make No. 1 Common or better lumber. Cull is high; one in 5 trees have more than 50 percent defect and four out of 5 trees average about 15 percent defect.

#### MAJOR RESEARCH FACILITIES

Research conducted by the White Pine-Hardwood Center is concentrated at five different locations. These are described below.

### The Bartlett Experimental Forest

The Bartlett Experimental Forest, 2,500 acres of forest land in the Saco Ranger District of the White Mountain National Forest, was set aside on March 23, 1932 "for experiments and demonstrations in the management of northern hardwoods"

(Fig. 1). The Experimental Forest extends into the village of Bartlett, New Hampshire, on U. S. Highway No. 302. Elevations range from 680 feet in the Village to about 3,000 feet at the highest point. Limited areas are steep and precipitous, but much of the land is reasonably level or has moderate slopes; it is well served with a network of gravel roads. Practically the entire Forest is well stocked with stands of various ages. Softwoods predominate on upper slopes, but elsewhere the stands are primarily northern hardwoods. The Bartlett Village water reservoir is on a  $3\frac{1}{2}$ -acre exception within the Experimental Forest. About two-thirds of the Forest lies immediately above, and drains into, this reservoir. The principal headquarters facilities are: a 2-story combination office and dormitory building, a small cottage, and several garages and other out buildings.

### The Burlington Project

The Burlington Project was initiated during the summer of 1956 in cooperation with the University of Vermont Departments of Forestry and Botany. Headquarters offices located at Burlington, Vermont, are rented from the University. Research of mutual interest covers a broad field, but is concentrated in: (1) relationships between various soil series and soil site factors, and the establishment, growth, and quality development of commercially important northern hardwoods; (2) the variations in sap volume yield from sugar maple trees, the relationships between sap volume and sugar content, and the significance in the maple sap flow mechanism of changes in alcohol-extractable water between frozen and unfrozen wood; (3) genetics research in sugar maple and other northern hardwoods; and (4) hardwood planting methods. A substantial part of the research work is carried out on University holdings, particularly the Jericho Experimental Forest and the Proctor Sugar Maple Farm. Insofar as practical, the University makes available laboratory and other similar facilities for joint studies. The Vermont Forest Service cooperates in providing necessary forest nursery facilities for experimental purposes at Essex Junction, Vermont.

## The Hubbard Brook Experimental Forest

The Hubbard Brook Experimental Forest in the Pemigewasset Ranger District of the White Mountain National Forest, was set aside in May 1955 for "long-range intensified research" primarily in the field of forest watershed management. It is a 7,500-acre tract, much of which is steep, well broken up into small drainages, and almost entirely covered with either northern hardwood or, at the higher elevations, softwood forests. The eastern portion of the tract is near the village of West Thornton; the Experimental Forest lies in several towns. Elevations range from less than 1,000 to more than 3,300 feet. There are a large number of tributary streams, well suited for gaging, flowing from both the north and south slopes into the main stream, Hubbard Brook, which flows in an easterly direction. To date, headquarters facilities have been rented but an administrative site including a dwelling, is in the process of being acquired. An all-weather main road has been built about one-third the distance into the forest and is being extended [as needed] to open up additional study areas. Some spur roads have been added to serve the present three stream gages and provide access to sites where additional sharp-crested weirs will be built.



## The Lawrence Hopkins Memorial Experimental Forest

The 1,625-acre Lawrence Hopkins Memorial Experimental Forest at Williamstown, Massachusetts, was a "grant to the United States of America" made by the President and trustees of Williams College in 1935. Thus, it does not have National Forest status. The government will retain title so long as the Forest is "devoted to the investigation of the various problems bearing on the establishment, growth, management, and protection of forests, and the promotion, development, and production of desirable forms of wildlife in this Commonwealth, and also in adjacent states with special reference to the rehabilitation and best use of lands formerly devoted to agriculture, and now in various stages of regrowth." Much of the Hopkins Forest was at one time either under cultivation or used for pasture. There still remain considerable areas of open land and also considerable areas that are in various stages of reversion to forest growth. In general, the topography of the Hopkins Forest can best be described as sloping. The maximum elevation is near the tri-state corner (Vermont, Massachusetts, and New York) and slopes with numerous breaks in an easterly and southerly direction. The buildings--dwellings, garage and storage, work shop--although now fairly substantial, represent only a small fraction of the structures that were present when the tract was acquired.

### The Massabesic Experimental Forest

The Massabesic Experimental Forest, some 3,700 acres of forest land, was acquired under authorization as provided by the House of Representatives of the 87th Legislature, February 12, 1935, and the Senate of the 88th Legislature, February 19, 1937. The tracts acquired included the "Bates College Estate" and other adjacent lands in 4 towns near Alfred, Maine. These lands were to be used "by the U. S. Forest Service as a forest experimental station." In general, the terrain of the Experimental Forest varies from hills, including many rocky outcrops, to level sections of sand plains; differences in elevation are very moderate. About 3,000 of the 3,700 acres, mainly white pine forest land, were burned over in the 1947 fire and additional substantial losses of timber have resulted from two hurricanes. The headquarters development, two miles from the town of Alfred, includes a large dwelling and an office building, as well as garages and a work shop.

## CENTER PROGRAM

### Headquarters and Bartlett Experimental Forest

Major forest types in which work is being done:  
northern hardwood.

#### Major research projects

1. Compartment management study (50 percent of time);  
24 compartments. Main variables: management system  
(tree selection, patch, diameter limit, clear-cut),  
3 growing stock levels, 4 cutting cycles, 2 product  
objectives, in all-aged and even-aged stands.
2. Methods of sampling for tree and stand quality--  
completed 1958 (10 percent of time).
3. Studies of birch regeneration after patch cutting--  
effects of size of patch, position in the patch,  
seedbed condition (10 percent of time).

#### Other activities (30 percent of time)

1. Farm woodland demonstrations, 2 units.
2. CPL plots.
3. A thinning study in second growth, started 1936.
4. Partial cuttings in old growth, started 1933.
5. Informal study on technique for cleaning sapling  
stands.

### Burlington Unit

Major forest type in which work is being done: northern hardwood.

Major research projects (time about equally divided among the following 4 items):

1. Soil-site studies (Curtis of Station and Miller of Vermont staff collaborating); presently working with evenaged northern hardwood stands, trying to find means for estimating site quality that are more useful than the conventional height over age.
2. Genetics (Gabriel); much of intended sugar maple work has been delayed by seed crop failure in 1957; major work to date has been a vegetative propagation study (cuttings of different clones in different media), planning a breeding program and provenance tests with sugar maple, and starting a birch breeding arboretum.
3. Hardwood regeneration, with emphasis on sugar maple and yellow birch (Leak); various small studies dealing with factors affecting seedling production in the nursery, and those affecting survival and growth in the field. (Leak will transfer this fall, Gilbert will come in as Unit Leader).
4. Physiological investigations, with emphasis on sugar maple (Atkinson); work just getting organized. Studies to deal with vegetative propagation and the effects of Hormodin #3 and supplemental light treatments, and with refinement of techniques for determining sugar content of sap of small seedlings.

Cooperative aid research at Vermont Agricultural Experiment Station:

1. Botany Department: studies of volume yields of sap in sugar maple, and relationships between volume and sugar content; studies of the sap-flow mechanism, with emphasis on the significance of changes in alcohol-extractable water between frozen and thawed wood.
2. Forestry Department: coop-aid money has mostly gone into facilitating and expanding the soil-site studies.

## Hopkins Experimental Forest

Major forest type in which work is being done: northern hardwood.

### Major research projects:

1. Hybrid poplars: clonal tests, pilot plantations, planting experiments with rooted cuttings (50 percent of time).
2. Study of paper birch regeneration by strip cuttings; strip width and soil scarification the main variables. (10 percent of time).
3. Planting study in hardhack brushland: 4 species; various site preparation treatments (bulldozing, harrowing, roto-tilling, scalping, burning); release vs. no release after planting (10 percent of time).
4. Experiments in rooting sugar maple by air layering, testing different rooting media, different positions in the crown, different ages of trees, etc. (15 percent of time).

### Other activities (15 percent of time)

1. Informal study of natural variation in sugar content of sap of roadside trees and closed stands of sugar maple.
2. Assisting in the propagation work of the Burlington Unit.

## Massabesic Experimental Forest

Major forest type in which work is being done: white pine.

### Major research projects:

1. Compartment management study (40 percent of time); 10 compartments. Main variables: management system (shelterwood, patch, strip, and diameter-limit cuttings), 3 cutting practice levels or intensities of management represented by differences in size of patches, cutting cycles, and degree of hardwood control. Study restricted to unburned stands. The Forest has been damaged by blow-downs, as well as the 1947 fire.
2. Silvicides for TSI (25 percent of time), particularly aerial spraying to release white pine reproduction from hardwood sprouts on the areas burned in 1947. Tests have also been conducted with a tractor-mounted mist blower, and with back pack mist blowers for hardwood control in pine stands.
3. Direct seeding studies (15 percent of time); this work being expanded in 1958.

### Other activities (20 percent of time)

1. Farm woodland demonstration.
2. CPL plots.
3. Hybrid poplar clonal tests.
4. Supervision of rehabilitation action program--chiefly planting on the burn.

## PERSONNEL

### Permanent

1. Name: Victor S. Jensen (Vic)

Title: Research Center Leader

Current Assignment: Research administration at the White Pine-Hardwood Research Center in Laconia, N.H. -- 68% FM, 32% WM.

Major Professional Interest: Forest management; northern hardwoods and white pine; watershed management; utilization (low quality material).

Formal Education and Training: Bachelor of Science in Forestry, Univ. of Minnesota; Master's Degree, Forestry, Yale University; Statistical course, Washington, D.C.; temporary assignment, Forest Products Laboratory, Timber growth and Utilization Relationship Division.

Experience:

1923 - 3 mos. - Minnesota State Forest Service, Boundary canoe patrol.

1925-1927 - 3 years - U. S. Indian Service, Klamath Reservation, Oregon; Colville and Spokane Reservations, Washington; Forest Guard, timber scaler, forest assistant, senior forest ranger, and timber sale district supervisor.

June, 1928 - 1 year - U. S. Forest Service, National Forest administration, Payette National Forest, Idaho, and District 4 office, Ogden, Utah.

April 1, 1929 to present time - NEFES, Amherst, Mass. - Forest management research and research administration (except 1943-45 - 2 years - War Production Board, New Hampshire Lumber Advisor).

2. Name: Kenneth Raymond Bromfield ("Ken")

Title: Plant Pathologist

Current Assignment: Forest pathology. Conduct research on the magnitude, scope and effect of various tree diseases in both old growth and young forest stands and the relation of forest management and silvicultural practices to them-- 50% FM, 50% FDR.

Major Professional Interest: Forest Pathology. Diseases of northern hardwood species.



Formal Education and Training:

Univ. of Minnesota - Ph.D - Plant Pathology  
Penna. State Univ. - B.S. - Forestry  
New York University - (Pre-Meteorology "B" and Meteorology "A"  
Courses under auspices of the U.S. Air Force)

Experience:

Nov. 1947 to present - Plant pathologist, U.S.F.S., White Pine  
Hdws. Research Center, Laconia, N.H.  
July 1956 - Nov. 1957 - Plant pathologist, Fort Detrick,  
Army CmCl Corps.  
Sept. 1955 - July 1956 - Research Asst., Dept. of Pl. Path.,  
Univ. of Minn.  
June 1952 - Sept. 1955 - Plant pathologist - Fort Detrick,  
Army CmCl Corps.  
March 1951 - June 1952 - Research Asst., Dept. of Plant Path.,  
Univ. of Minn.  
Aug. 1949 - March 1951 - Botanist & Plant Pathologist, Fort  
Detrick, Army CmCl Corps.  
Sept. 1947 - June 1949 - Student Asst., Forest Dept., Penna.  
State Univ.  
Summer 1946 - Agricultural Aide, NEFES.  
June 1944 - May 1946 - Weather and Weather Communications Officer,  
USAF.  
March 1943 - June 1944 - Private and Aviation Cadet, USAF.

3. Name: Adrian Mortimer Gilbert ("Andy")

Title: Project Leader

Current Assignment: FM--northern hardwood silviculture and  
management (Compartment management, regeneration, cleanings  
and thinnings)

Major Professional Interest: FM--regeneration, intermediate  
cuttings, stand structure, and tree quality.

Formal Education and Training:

Univ. of Michigan - B.S.F., 1943;  
Swiss Federal Institute of Technology--advanced study in  
silviculture and management - 1948-1949;  
State University of New York, College of Forestry - candidate  
for Ph.D. - 1957-1958.  
Statistical seminar - 3 weeks - 1951.  
U. S. Army, European Theater - 1943-1946.

Experience: Sept. 1946 - joined U.S.F.S.; 1946-47, 8 mos. -  
Forest Survey, N.H.; 1947 - 5 mos. - Forest Survey, Penna.;  
1947-48, 9 mos. - Forest Survey, W.Va.; 1949, 3 mos. -  
Forest Survey, New York; 1950-52, 30 mos. - FE, compilation  
of survey data, statistical reports, resource analyses; 1952  
to present - FM research, Laconia Research Center, northern  
hardwoods.

4. Name: Stanley M. Filip ("Stan")

Title: Forester (Forest Management Research)

Current Assignment: Forest Management (Northern Hardwoods) - compartment management, improvement cuttings, costs and returns, natural regeneration, growth and yield, timber quality, small woodlot management. Safety program.

Major Professional Interest: Forest Management - methods of cutting, stocking and stand structure, timber quality, cutting cycles, rotations, improvement cutting, harvest cutting.

Formal Education and Training:

Pennsylvania State University, B.S. in Forestry, 1939.

State Teachers' College, E. Stroudsburg, Pa. - Teacher training in science, secondary education, summer 1939. Teacher certificate.

Statistical methods, Course A, 3 weeks, 1956 - Forest Service

Statistical methods, Course B, 7 weeks, 1958 - Forest Service

U. S. Marine Corps, 1944-1945 - Combat Intelligence.

Logging School - Nov. 1949 - 2 weeks, Fernow Expt. Forest, NEFES, Parsons, W. Va.

I&E training - Feb. 1950, Region 7, USFS, Warren, Pa.

Forest Fire Training - March 1956, White Mt. Nat. Forest, Bartlett, N. H.

Experience:

Sept. 1939 - Sept. 1941 - Consulting Forester, Wilkes-Barre, Pa.

Oct. 1941 - May 1943 - W.P.A. Project supervisor, Anthracite Forest Survey, NEFES, Kingston, Pa.

May 1943 - Feb. 1944 - Industrial Forester, Wyoming Valley Chamber of Commerce, Wilkes-Barre, Pa.

June 1945 - Oct. 1946 - Farm Forester, Wyoming Valley Chamber of Commerce, Pa. Dept. Forests and Waters, and U. S. Forest Service, Wilkes-Barre, Pa.

Oct. 1946 - July 1954 - Forest Management Research, NEFES, Kingston, Pa.

July 1954 to present - Forest Management Research, NEFES, White Pine-Hardwood Research Center, Laconia, N. H.

5. Name: John Casper Bjorkbom

Title: Forester (Silviculture)

Current Assignment: Forest management of northern hardwoods - compartment management, timber stand improvement, natural regeneration, skid road revegetation.

Major Professional Interest: Natural regeneration, thinning young hardwood stands, pruning hardwoods, phenology, seed quality.

Formal Education and Training:

Penna. State University, School of Forestry, B.S. degree - 1938  
Statistical Seminar 1951  
Statistical Seminar 1958  
Fire Training School 1956 - White Mt. Nat. Forest

Experience:

Nov. 1939 - June 1941 - Pa. Dept. Forests & Waters - General forestry  
June 1941 - March 1946 - U. S. Army  
March 1946 - Sept. 1947 - Pa. Dept. Forests & Waters - General forestry  
Sept. 1947 - Dec. 1947 - International Paper Co., Georgia - Timber marking  
Dec. 1947 - Oct. 1948 - Bon Ayr Coal Co., Penna. - Surveying.  
Oct. 1948 - Dec. 1951 - NEFES, Upper Darby, Pa. - Forest survey  
Dec. 1951 - May 1955 - NEFES, Upper Darby, Pa. - Forest Economics  
May 1955 - present - NEFES, White Pine-Hardwood R.C., Laconia, N. H. - FM research

6. Name: Robert Orin Curtis

Title: Forester (Silviculture)

Current assignment: FM - hardwood site studies.

Major Professional Interest: Silviculture of northern hardwoods and spruce-fir.

Formal Education and Training:

Yale University - B.S. (Plant Science) - 1950.  
Yale School of Forestry - M.F. (Forest Management and Silviculture) - 1951.  
NEFES - Statistical Course A (1954)  
U.S.D.A. Graduate School (Correspondence work):  
(a) "Statistical Methods" - 513C - 1955; (b) "soils and soils management" 316C - 1957.

Experience:

1948 - 3 mos. - Intermountain Forest & Range Expt. Sta. - study plot measurement, etc.  
1950 - 3 mos. - Northern Rocky Mt. Forest & Range Expt. Sta. - study plot establishment, timber marking.  
1952 to present - Northeastern Forest Expt. Station:  
3 years - Forest Survey  
2½ years - Paul Smiths Exp. Forest - compartment management studies.  
1 year - Burlington, Vt. - hardwood site studies.

7. Name: William J. Gabriel

Title: Geneticist (Plant)

Current Assignment: FM - Hardwood tree improvement.

Major Professional Interest: FM - Selection and breeding, racial variation, Exotics.

Formal Education and Training:

B.S. - Univ. of New Hampshire; M.F. - Duke Univ.; M.F. - Harvard Univ. Currently completing Ph.D. thesis as final requirement for degree at Harvard Univ.

Statistics Seminar "b" course

4 yrs. - U.S.A.F.

Experience:

1953-1954 - Cabot Foundation, Forest Genetics

1954 - 1956 - NEFES, Morris Arboretum - Forest Genetics

1956 - 1958 - White Pine Hdwd. R. C., Burlington, Vt. - Forest Genetics

8. Name: Thomas W. McConkey (Tom)

Title: Forester

Current Assignment: In charge, Massabesic Experimental Forest

Major Professional Interest: Silviculture.

Formal Education and Training: BS, 1932; MF, 1933; Cornell Univ.

Experience: 1933-1938, \*CCC, Jr. Forester, Timber Surveys and Timber Stand Imp., Camp Sup't.; 1939-1941, Timber Mgt. Ass't., Green Mountain N.F.; 1941-1946, Ass't. and Acting Dist. Ranger, White Mt. N.F.; 1946-1947, NEFES, Laconia, Spruce Budworm Cutting Plots; 1947 to present, Massabesic Expt. Forest, Forester in charge.

\* 1933-1938: Geo. Washington, White Mountain, and Cumberland National Forests.

9. Name: Frank E. Cunningham

Title: Forester (Research) General

Current Assignment: FM - Exp. Forest Management and Administration, Forest Planting, Natural Regeneration Studies, Forest Tree Improvement Work, especially with Sugar Maple and Northern Hardwood Species.

Major Professional Interest: FM - Forest Genetics, Tree Improvement Work, Forest Planting - Land Rehabilitation work.

Formal Education and Training:

New York State College of Forestry - 3½ years.  
Statistical Seminar at Beltsville, Md. - 3 weeks in 1954.  
Photography Seminar at Bartlett, N. H. - Sept. 1956.

Experience:

1933-38 - 6 years, fall, winter, and spring--Bartlett Expt. Forest; Field Assistant.  
1934-40 - 7 years - Chenango Exp. Forest, N.Y. State; Supervision of CCC boys in forest management and watershed studies.  
1941-42 - 2 years - N.Y. State Conservation Dept., Supervision of CCC and Conscientious Objectors, in forest planting;  
1942-46 - 4 years - Allegheny Forest Exp. Station - R.P.S. Surveys in New York and New England States; cooperated with State of Connecticut in stimulating use of low-grade wood products; and studying timber types in Anthracite Region of Pennsylvania.  
1946 - present - Operating Hopkins Memorial Experimental Forest at Williamstown, Mass. for NEFES; engaged in establishing hybrid poplar plantations, and conducting tree improvement studies.

10. Name: William Bard Leak

Title: Research Forester (General)

Current Assignment: FM - hardwood nursery and planting methods.

Major Professional Interest: FM - regeneration of northern hardwoods.

Formal Education and Training:

State University of New York - College of Forestry -B.S. - 1953.  
" " " " " " " " M.F. - 1956.  
Northeast. Forest Expt. Station - Statistical Course "B" - 1958.

Experience:

July 1953 - June 1955 - Cpl.- U. S. Army  
1952, 1956 - 7 mos. - Bartlett Expt. Forest - Timber cruising, marking.  
1956 - 1957 - 7 mos. - White Pine Hwd. Research Center, Laconia, N. H. - FM Research, Hardwood Nursery and planting project.  
May 1957 - present - Burlington, Vt., FM Research, Hardwood Nursery and planting project.

11. Name: Oscar Raymond Atkinson, Jr.

Title: Research Forester

Current Assignment: Physiology of flowering and fruiting, vegetative propagation, nutrient requirements and sap extraction in sugar maple.

Major Professional Interest: Physiology of hardwood species - vegetative propagation, effect of light and hormones on rooting of clones of sugar maple and nutrient requirements of hardwood seedlings.

Formal Education and Training:

University of Maine, B.S. Forestry - 1954

" " Vermont, M. S. Botany - 1957

" " Rhode Island, Diploma in Basic Engineering - 1944  
(A.S.T.P.)

Military Service - Jan. 1943 - Feb. 1946 - Army, Overseas assignments in England, France, and the Philippine Islands.

Experience:

1952 - 3 mos. - International Paper Co., Livermore Falls, Me.

Surveying; 1954 - 3 mos. - NEFES, Bartlett Expt. Forest -

Cruising and marking; 1954-1956 - Graduate Teaching Asst.,

Univ. of Vermont, Burlington, Vt. - Botany; 1956 - 3 mos. -

NEFES, Bartlett Expt. Forest - Cruising, surveying, marking;

1956-1957 - Teaching Asst. (Botany), Univ. of Vermont,

Burlington, Vt.; June-July 1957 - Forestry Aide (Research),

NEFES, Bartlett Expt. Forest - T.S.I.; July 22-Sept. 22, 1957 -

Research Forester, Bartlett Expt. Forest - Cruising;

Sept. 22 to present - Research Forester, NEFES, Burlington,

Vt. - Basic Research.

12. Name: David A. Marquis

Title: Research Forester

Current Assignment: Forest Management - Compartment management, timber quality, timber stand improvement, small woodlot management.

Major Professional Interest: Forest management.

Formal Education and Training:

B. S. Forestry - Pennsylvania State University - 1955.

1955-1957 - U. S. Army, Corps of Engineers

Experience:

1957 - present - NEFES; Forest Management Research, Laconia, N.H.

13. Name: George Yelenowsky

Title: Research Forester, General

Current Assignment: Forest Management Research, Laconia and Bartlett Experimental Forest.

Major Professional Interest: Forest management research, mensuration, forest survey.

Formal Education and Training: BSF, Penn State, 1955; MSF, Penn State, 1958.

Experience: 1950-51 - Second Helper in steel mill;  
1952 (3 mos.) - second loader, Kosmos Timber Company,  
Kosmos, Wash.; 1952 (3 mos.) - USFS road location; 1954  
(3 mos.) NEFES (Bartlett Exp. For.); 1955-1956 (15 mos.)  
NEFES, Forest Survey.

14. Name: Charles E. Swett ("Charley")

Title: Forestry Aide (Research)

Current Assignment: Massabesic Experimental Forest,  
Operational aspects: logging, planting, thinnings and  
pruning, stand records.

Major Professional Interest: Silviculture and forest management.

Formal Education and Training: Through third year of Kennebunk  
High School; P.F.C., U.S. Army, March 15, 1943 to January 30, 1946.

Experience: Massabesic Experimental Forest: Beginning  
Feb. 9, 1948 to 1952 - timber scaler, member of logging  
crew; 1952 to present - Forestry Aide - in charge of all  
forestry and general administrative work projects on the  
forest.

15. Name: Donald F. Thompson ("Don")

Title: Forestry Aide (Research)

Current Assignment: Massabesic Experimental Forest, Operational  
aspects, silviculture.

Major Professional Interest: Silviculture

Formal Education and Training: Graduate of Alfred, Maine High  
School; Air Force, Jan. 1943 to Oct. 1945.

Experience: Sept. 1954 - April 1956 - Forest Worker, Massabesic  
Expt. Forest; Nov. 1947 - Forestry Aid, GS-3 - work on  
silvicultural treatments and experimental plots.

16. Name: Richard J. Peterson ("Dick")

Title: Forestry Aide (Research)

Current Assignment: FM - Field Assistant - Hopkins Experimental  
Forest.

Major Professional Interest: FM - Land Management, Northern  
Hardwood Stands, Forest Tree Nurseries, etc.



Formal Education and Training: Stockbridge School of Agriculture, Amherst, Mass., 2 year course, Forestry 1952-1954. 1954-1956 - U. S. Army Transp. Corps, Germany

Experience: Summer - 1952 - U. S. Forest Service, Stanislaus National Forest, TSI work; 1956 to present - U. S. Forest Service, Hopkins Experimental Forest, Research Field Assistant.

17. Name: Marguerite M. Stothart ("Maggie")

Title: Clerk-Stenographer

Current Assignment: Stenographer in charge of Laconia office of White Pine-Hardwood Research Center--65% FM, 35% WM.

Major Professional Interest: Research Foresters.

Formal Education and Training: Graduate of Laconia High School; 3 years night school training in Secretarial subjects; private tutoring in same.

Experience: 1927-1933 - Clerk in jewelry store, including manufacture of jewelry; 1933-1934, Clerk in State Reemployment Office; 1934-1944, Clerk-Typist for White Mountain National Forest, Laconia, N.H.; 1944-1948, at home for family reasons; 1948 to present time, Clerk-Stenographer for Northeastern Forest Experiment Station (WAE basis from Oct. 1948 to November 1, 1954).

18. Name: Velna Sleeper Tomlinson ("Vel")

Title: Clerk-Typist

Current Assignment: Clerk-Typist and stenographic duties in the Laconia office of the White Pine-Hardwood Research Center--80% FM, 20% WM.

Formal Education and Training: South Middlesex Secretarial School, Framingham, Mass; Framingham High School, Framingham, Mass.

Experience: 1933-42, Dennison Mfg. Co., Framingham, Mass., Comptometer Operator and Statistical Clerk; 1942-44, Dennison Mfg. Co., Framingham, Mass., Cost Accountant; 1945, 12 mos., American Milk Goat Record Assoc., Sherborn, Mass., Asst. to the Secretary; 1951-55, Pittsfield Leather Co., Div. of Winslow Bros. & Smith Co., Pittsfield, N.H., Secretary to General Manager and Billing Clerk; 1955-57, Belknap County Ext. Serv., Laconia, N.H., office secretary; 1957 to present, NEFES, Laconia, N.H., Clk.-Typist.

Summer Assistants

1. Ernest Kurmes, GS-5, Yale University
2. Joseph Whitecavage, GS-4, Penn State University
3. Eugene Field, GS-4, Syracuse University
4. Richard Shepler, GS-4, University of Massachusetts